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PLANMECA ProMax 3D Mid

installation manual

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The manufacturer, assembler, and importer are responsible for the safety, reliability and performance of the unit only if:

- installation, calibration, modification and repairs are carried out by qualified authorized personnel
- electrical installations are carried out according to the appropriate requirements such as IEC 60364
- equipment is used according to the operating instructions

Planmeca pursues a policy of continual product development. Although every effort is made to produce up-to-date product documentation this publication should not be regarded as an infallible guide to current specifications. We reserve the right to make changes without prior notice.

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1 INTRODUCTION

This manual contains all the information required to install and calibrate the Planmeca ProMax 3D Mid X-ray unit. Please read this manual carefully before installing the unit.

NOTE You will also need the ProMax 3D Mid X-ray unit's technical manual during installation. The adjustment instructions are given in technical manual.

NOTE The Planmeca Romexis software has a separate installation manual. You will also need the Planmeca Romexis software user's manual.

NOTE The X-ray unit's software revision is shown briefly on the control panel when the unit is switched on. This manual is valid for software revision 1.0.0.0.r or later. This software revision is compatible with Romexis software revision 2.4.0.r or later. Note, however, that Didapi software revision 4.7.0.R or later is required for 2D imaging and SmartPan.

2 PRE-INSTALLATION INFORMATION



DO NOT CONNECT ITEMS WHICH ARE NOT SPECIFIED AS PART OF THE SYSTEM.



THE X-RAY UNIT MUST BE CONNECTED TO A DEDICATED, PROTECTIVELY GROUNDED POWER LINE (NO OTHER DEVICES ARE CONNECTED TO THE SAME POWER LINE).



DO NOT CONNECT A MULTIPLE PORTABLE SOCKET OUTLET (MPSO) OR EXTENSION CORD TO THE SYSTEM.

NOTE The PCs connected to the system must be:

- approved by local authorities: e.g. IEC-approved (CE marked), UL/CSA approved
- located outside the patient area (more than 2m (79 in.) from the X-ray unit) and
- protectively grounded.

NOTE External equipment intended for connection to signal input, signal output or other connectors, shall comply with relevant IEC standard (e.g. IEC 60950 for IT equipment and the IEC 60601 series for medical electrical equipment). In addition, all such combinations - systems - shall comply with the standard IEC 60601-1-1, Safety requirements for medical electrical systems. Equipment not complying to IEC 60601 shall be kept outside the patient area (more than 2m (79 in.) from the X-ray unit). Any person who connects external equipment to signal input, signal output or other connectors has formed a system and is therefore responsible for the system to comply with the requirements of IEC 60601-1-1.

NOTE EMC requirements have to be considered, and the equipment must be installed and put into service according to the specific EMC information provided in the Technical Manual, section "EMC INFORMATION".

NOTE Portable and mobile RF communications equipment can affect the X-ray unit. For minimum distance between portable and mobile RF communications equipment and the X-ray unit, see Technical Manual, section "EMC INFORMATION".

NOTE The X-ray unit can be disconnected from the mains power supply by unplugging the mains cable.

NOTE Never place or hang any objects on any part of the X-ray unit.

NOTE Make sure that you cannot get caught or hooked up on any part of the X-ray unit. Keep loose items of clothing, hair and jewellery tucked away safely.

2.1 Radiation protection

Protect yourself from radiation when you check the radiation beam alignment.

The room in which the X-ray is to be installed and the position from where the user is to operate the equipment must be correctly shielded from radiation. Since radiation safety requirements vary from country to country and state to state it is the responsibility of the installer to ensure that all safety regulations are met.

**WARNING**

FAILURE TO INSTALL THE X-RAY UNIT IN AN APPROVED LOCATION MAY BE DANGEROUS TO BOTH PATIENT AND OPERATOR.

2.2 Environmental requirements

NOTE The X-ray unit must be installed in a location where the user can freely monitor the patient during the whole imaging process. For minimum operational space requirements, see section 2.5 “X-ray unit dimensions” on page 6.

Wall strength

The X-ray unit must be attached to the wall prior use. Make sure that the wall will support the X-ray unit. The wall bracket installation must be able to resist a pull-out force of 5518 N (551.8 kg, 1216 lb).

In case the X-ray unit is not attached to the wall, a free standing support must be used.

Temperature & Humidity

The operating temperature range is from +10°C to +35°C, non-condensing. The transport and storage temperature range is from 0°C to +50°C. The acceptable humidity range is from 15 to 85%.

NOTE If the X-ray unit has been stored at temperatures below +10°C for more than a few hours, time must be allowed for the unit to reach room temperature before connecting it to the mains voltage.

2.3 Power requirements

Make sure that the power requirements of the X-ray unit are the same as the power that is to be used. The X-ray unit is designed to operate using 100-240V~ universal power supply. The power requirements are printed on a label which is attached to the mains cable. They are also printed on the label located at the base of the stationary column. If the voltage is likely to fluctuate by more than $\pm 10\%$ you will need to install a UPS (Uninterruptible Power Supply) for the X-ray unit and PCs to ensure correct operation. The mains frequency can be either 50 or 60 Hz.

Make sure that there is a dedicated, grounded power outlet within 2.5 meters (8 feet) of where the X-ray unit is to be installed.

CAUTION *Never connect the X-ray unit to the mains without first checking the voltage setting. Incorrect voltage setting can cause damage to the unit electronics.*

2.4 3D system requirements

The 3D digital system consists of Planmeca ProMax 3D Mid X-ray unit with 3D digital sensor, Ethernet card, reconstruction PC, one or more PCs and a Planmeca Romexis software package.

Client PC system requirements (minimum)

- **Operating system**
Windows Vista, Windows 7 or Mac OS 10.5 (64-bit operating system)
- **RAM**
8 GB
- **Hard disk**
320 GB
- **Processor**
3 GHz Core Duo or equivalent
- **Monitor**
1280 x 1024
- **Graphics card**
ATI or NVIDIA, 512 MB minimum memory
- **Peripherals**
DVD-ROM drive

Database server requirements (minimum)

- **Operating system**
Windows XP Pro, 2003 Server, Vista or Windows 7 (32-bit or 64-bit operating system)
- **RAM**
3 GB
- **Hard disk**
2 x 500 GB (RAID1)
- **Processor**
3 GHz Core Duo or equivalent
- **Backup medium**
DAT or equivalent
- **Monitor**
1024 x 768
- **Graphics card**
Not required
- **Peripherals**
DVD-ROM drive

Network switch

10/100 Mb/s

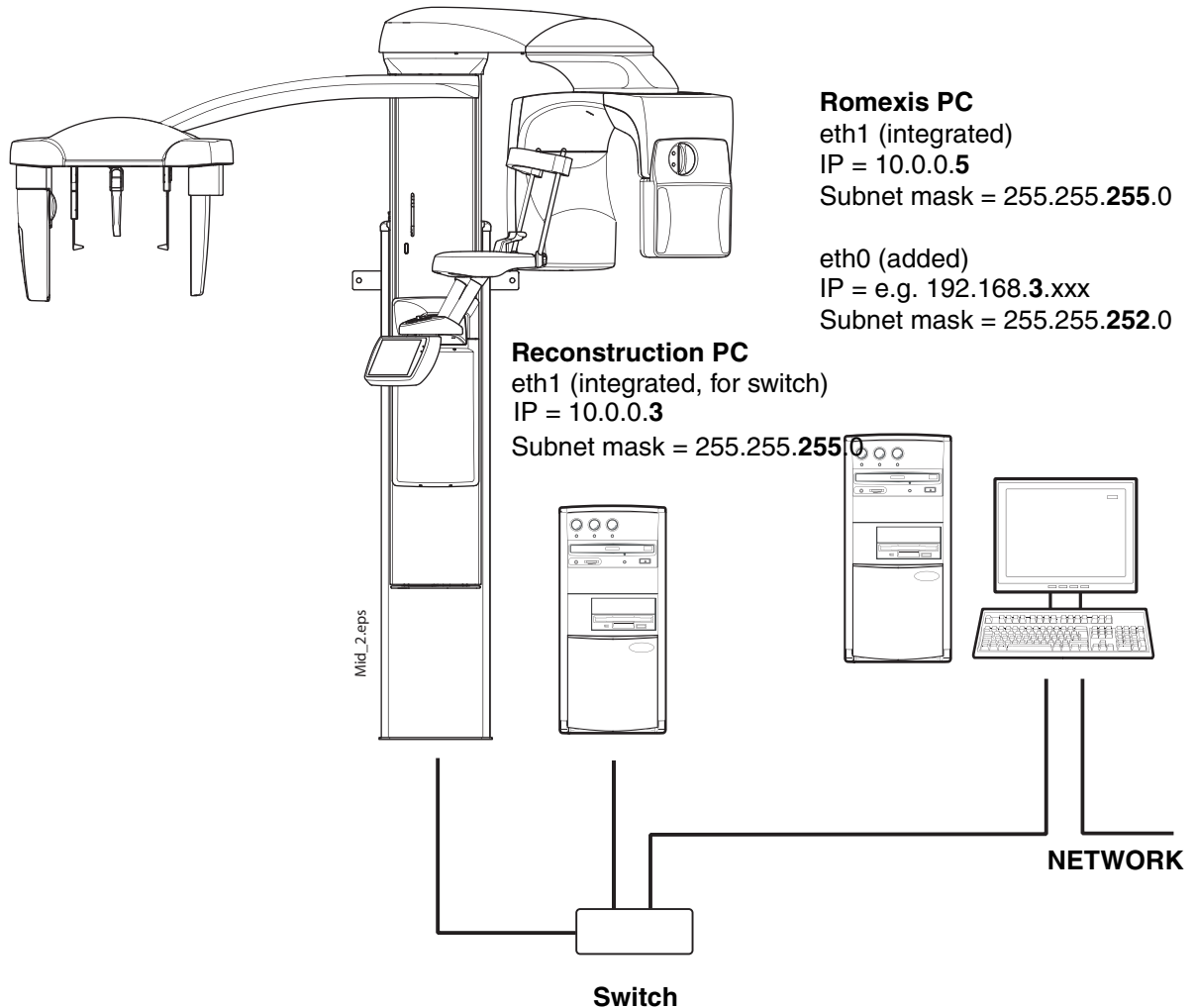
Planmeca ProMax 3D Mid system network architecture with subnet

Planmeca ProMax 3D Mid

IP = 10.0.0.2

Subnet mask = 255.255.255.0

Gateway = 0.0.0.0



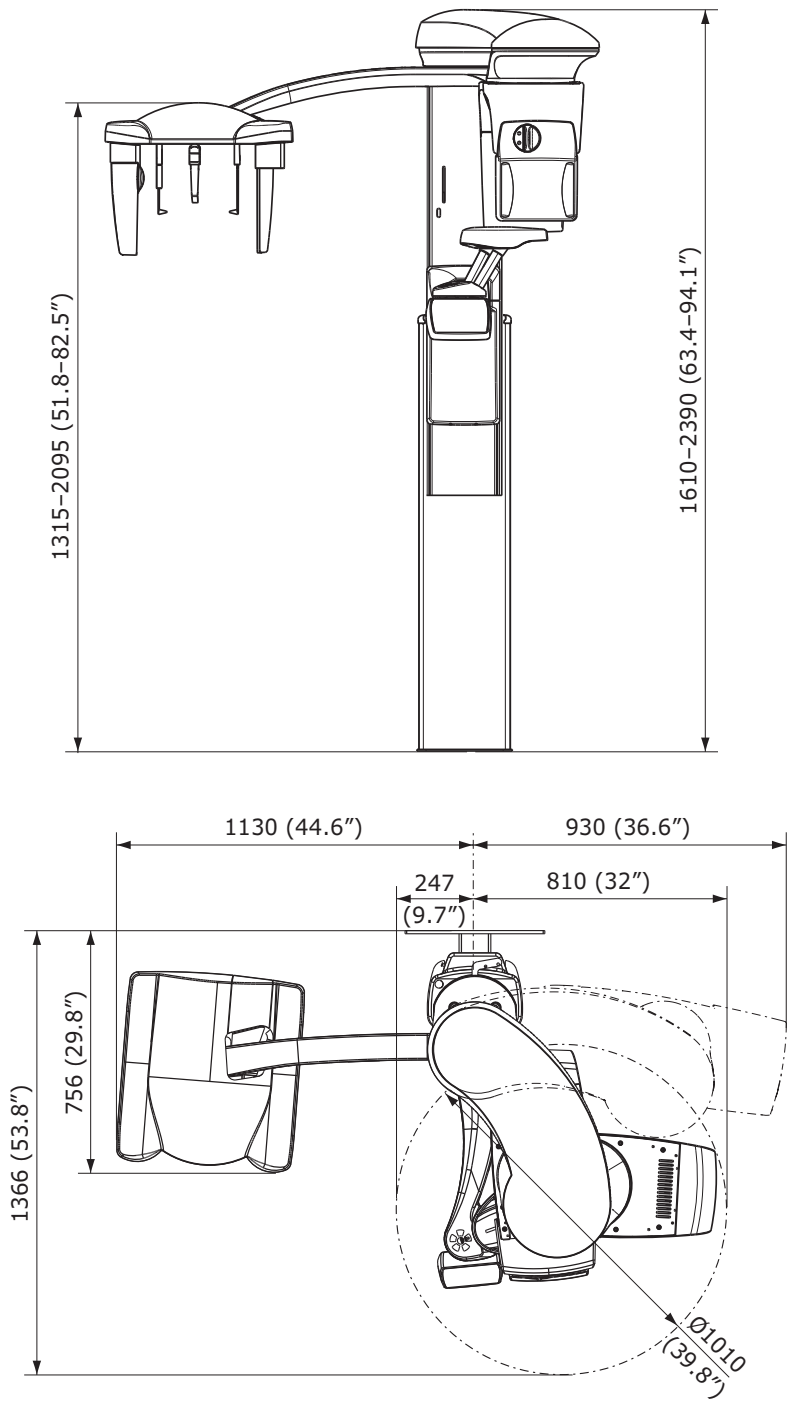
NOTE! **Reconstruction PC**
eth0 (integrated, for sensor)
IP = 192.168.65.1 should NOT be changed
Subnet mask = 255.255.255.0

NOTE Each image acquisition work station (Romexis PC) in the network has to use a different IP address.

NOTE The network has to be protected by a firewall.

2.5 X-ray unit dimensions

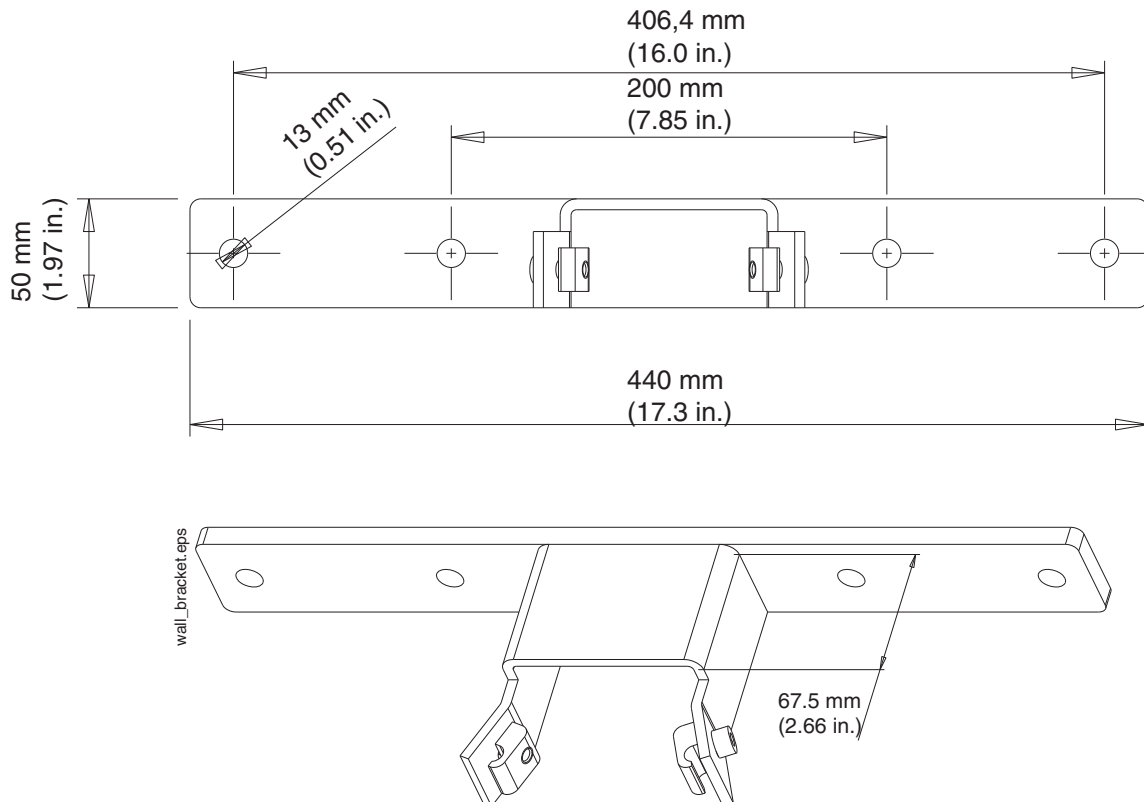
The numbers given in the figure below are the nominal, physical measurements of the X-ray unit. The minimum operational space requirements are given in the table.



Minimum operational space requirements for the digital X-ray unit

Equipment	Width	Depth	Height
Planmeca ProMax 3D Mid X-ray	1500 mm 59 in.	1630 mm 64 in.	1610 - 2390 mm 63.4 - 94.1 in.
Planmeca ProMax 3D Mid X-ray with cephalostat	2150 mm 85 in.	1630 mm 64 in.	1610 - 2390 mm 63.4 - 94.1 in.

2.6 Wall bracket dimensions



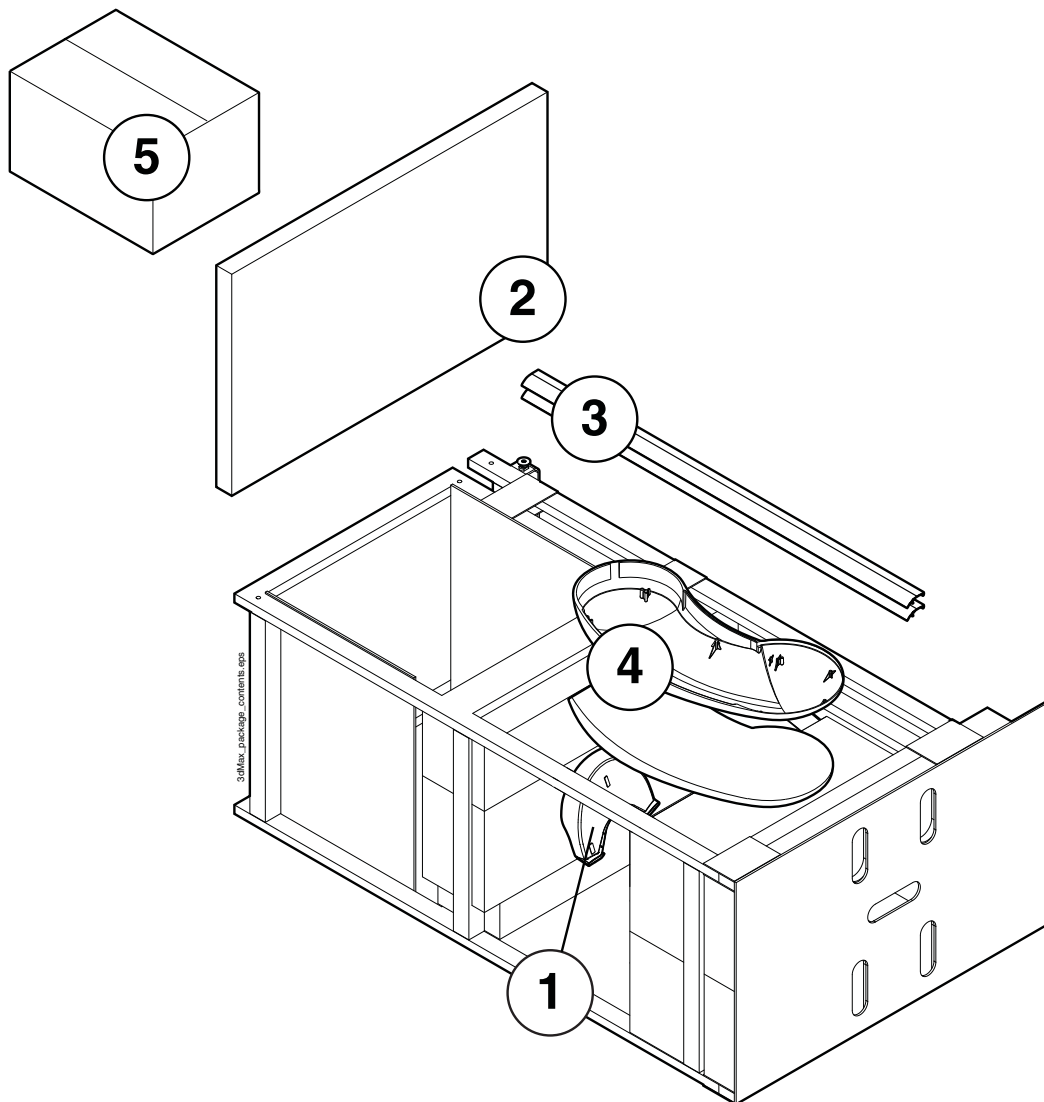
3 CONTENTS OF THE SHIPMENT

3.1 Packages

The shipment consists of three packages.

Package 1 contains:

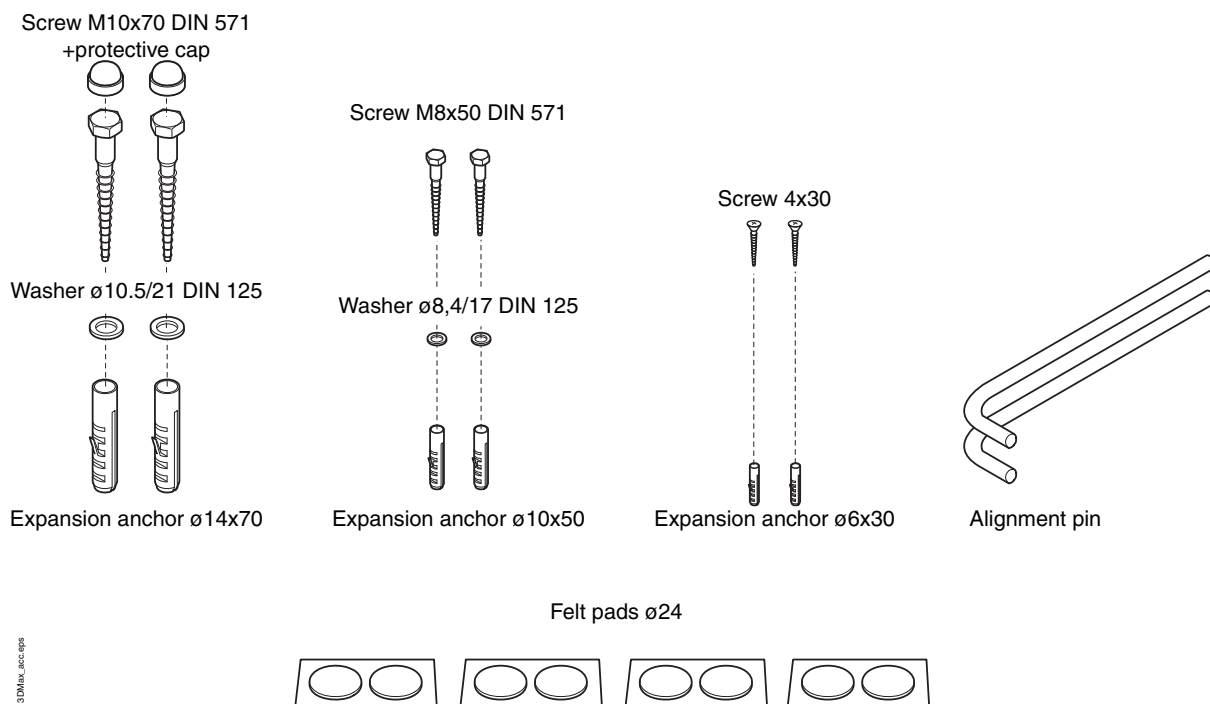
1. Planmeca ProMax 3D Mi X-ray unit
2. Package protective part
3. Stationary column side covers
4. Shoulder arm cover
5. Accessories carton
(3D Mid sensor covers, wall bracket(s), cable holder, Ethernet cables, calibration tools, mounting accessories as described below, product manuals)



Mounting accessories

The mounting accessories bag is inside the accessories carton (5). The contents are:

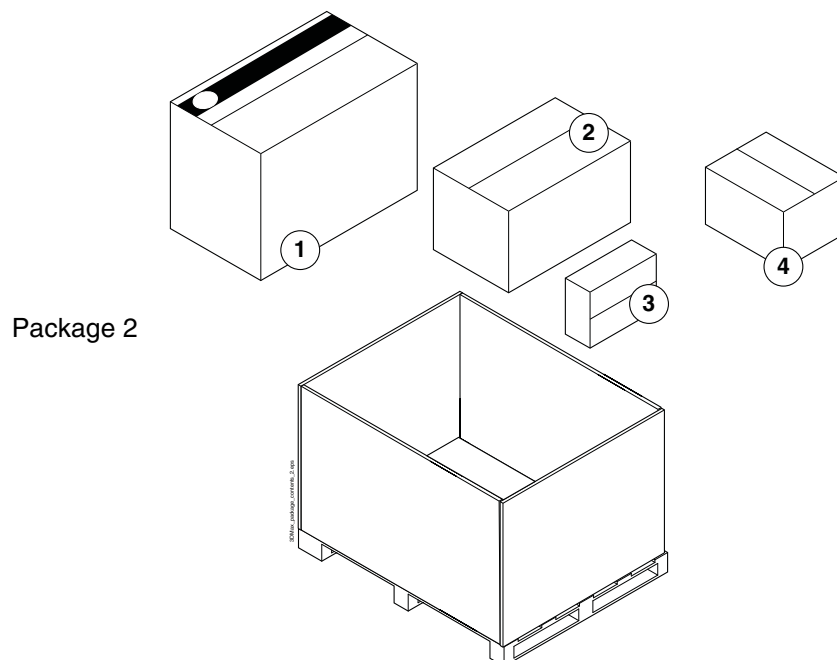
PART	QTY	REFER TO
Felt pads		section 5 “UNPACKING THE X-RAY UNIT” on page 12
Screw M10x70 DIN 571 + protective cap	2	section 6.1 “Attaching the X-ray unit to the wall” on page 14
Washer ø10.5/21 DIN 125	2	
Expansion anchor ø14x70	2	
OPTIONAL: Cover plugs to close unneeded holes in wall bracket		
Screw M8x50 DIN 571	2	section 6.2 “Attaching the X-ray unit to the floor” on page 18
Washer ø8.4/17 DIN 125	2	
Expansion anchor ø10x50	2	
Screw 4x30	2	section 7 “INSTALLING THE EXPOSURE SWITCH” on page 26
Expansion anchor ø6x30	2	
Alignment pin	2	ProMax 3D Mid Technical Manual



CONTENTS OF THE SHIPMENT

Package 2 contains:

1. Reconstruction PC
2. 3D Midsensor
3. Switch
4. Soft patient support (head bands and support bars)



Package 3 contains:

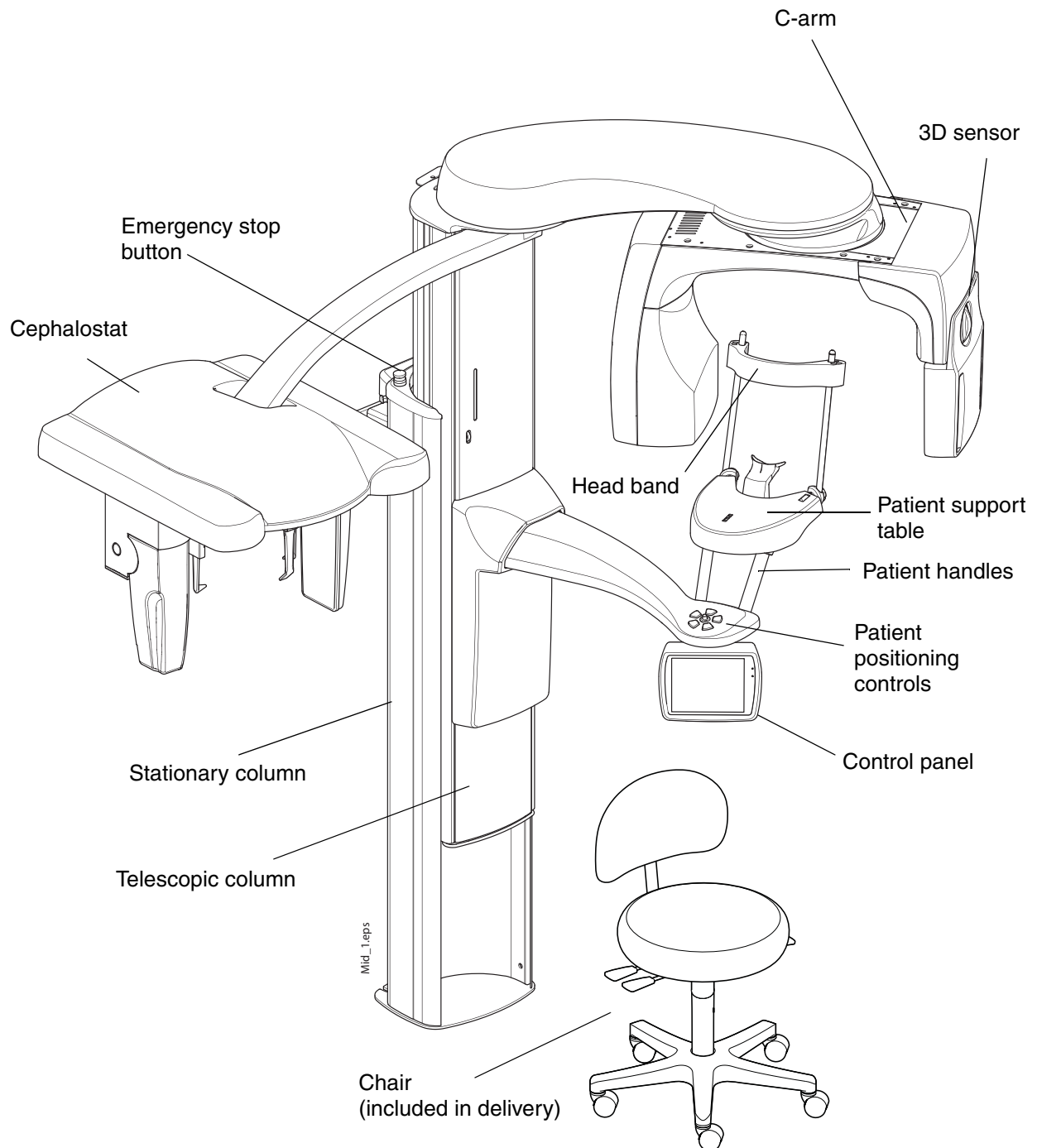
1. Chair

3.2 Associated documentation

Install the X-ray unit according to the instructions given in this manual. Perform the adjustments according to the Technical Manual, and verify the operation of the installed X-ray unit according to the User's Manual(s).

All the documentation listed above is supplied with the X-ray unit.

4 GENERAL VIEW OF THE X-RAY UNIT

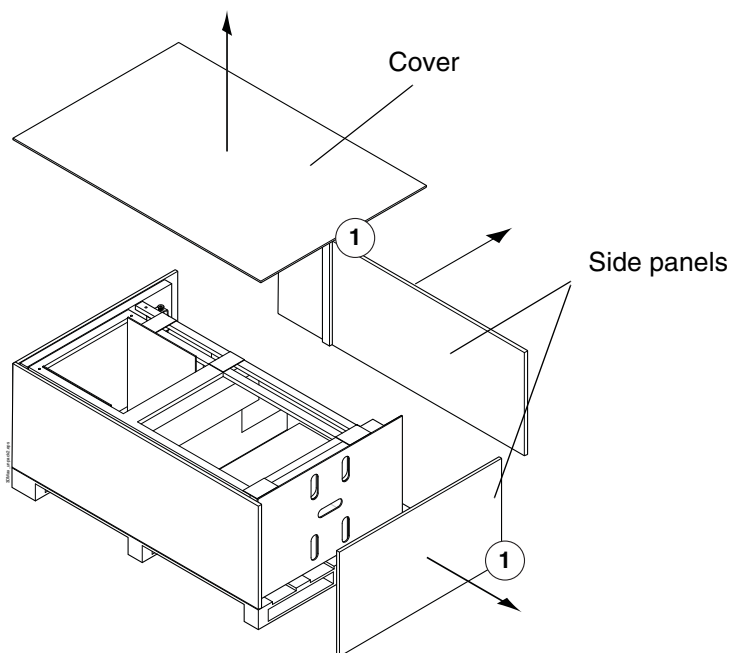


5 UNPACKING THE X-RAY UNIT

NOTE The edges of the shipping crate may be sharp. Use gloves when handling the crate.

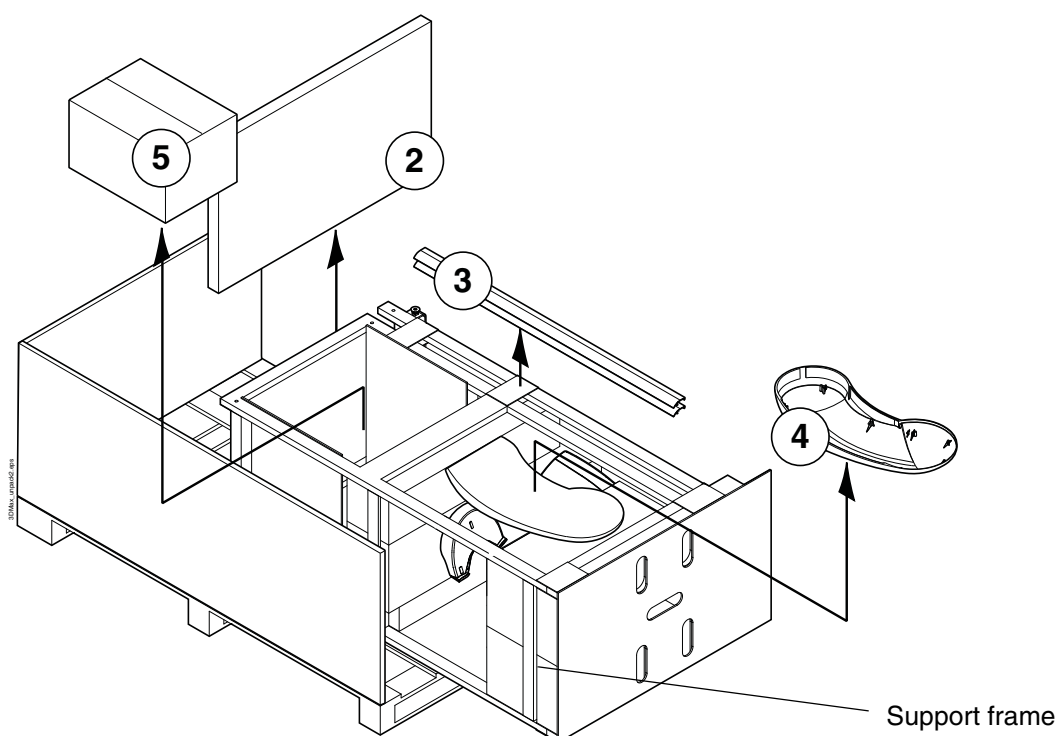
The X-ray unit is delivered in a wooden shipping crate as shown below.

Remove the screws that secure the cover and two side panels in position. Remove the cover and panels (1).



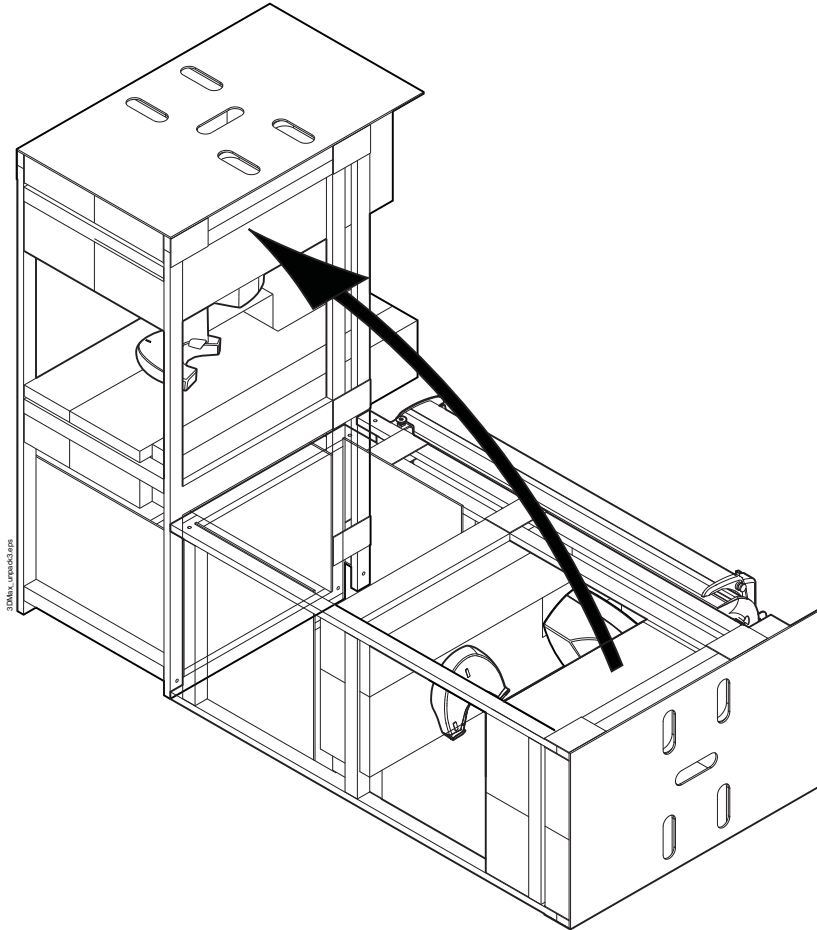
Remove the protective part (2), column side covers (3), shoulder arm cover (4) and accessories carton (5).

Pull the support frame slightly off the pallet so that you can lift the X-ray unit up.



- NOTE** Do not remove the support frame until the X-ray unit has been attached to the wall.
- NOTE** Attach felt pads (included in the delivery) to the underside of the column base plate before you lift the X-ray unit up.

Now lift the X-ray unit up.



Units with cephalostat: Remove the cephalostat from its package. Note, that the cephalostat arm is attached to the package with the parts that you will need when you attach the cephalostat arm to the X-ray unit column.

6 INSTALLING THE X-RAY UNIT

NOTE The X-ray unit must be installed in a location where the user can freely monitor the patient during the whole imaging process. For minimum operational space requirements, see section 2.5 “X-ray unit dimensions” on page 6.

NOTE Make sure that there is a dedicated, grounded power outlet within 2.5 meters (8 feet) of where the X-ray unit is to be installed.

6.1 Attaching the X-ray unit to the wall

NOTE The wall bracket installation must be able to resist a pull-out force of 5518 N (551.8 kg, 1216 lb).

NOTE For dimensions of the wall bracket, see section 2.6 “Wall bracket dimensions” on page 7. For installation drawing, see section 12 “DIAGRAMS” on page 61.

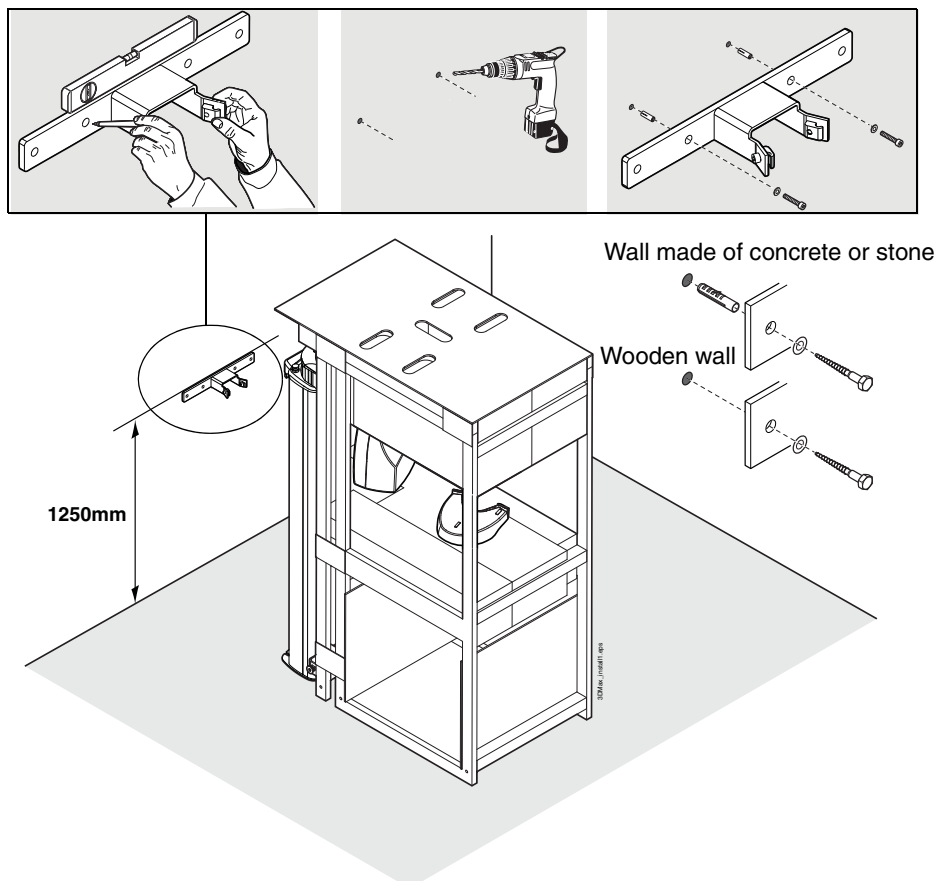
Use the wall bracket to mark the position of the mounting screws. Either two or four screws can be used to secure the bracket to the wall. The bracket is positioned approximately 1250 mm (49.2 in.) from the floor. Use a spirit level to ensure that the wall bracket is level.

If the wall is made of concrete or brick, use the 10x70 DIN 571 lag screws and the 14x70 expansion anchors to secure the wall bracket in position. Drill securing holes (ø14mm (0.55 in.), 85 mm (3.3 in.) in depth) and insert the expansion anchors into the holes.

If the wall is made of wood, use the 10x70 DIN 571 lag screws. Do not use expansion anchors with wooden wall. Drill securing holes (ø7 mm (0.3 in.), 70-75 mm (2.75-3 in.) in depth) for the mounting screws.

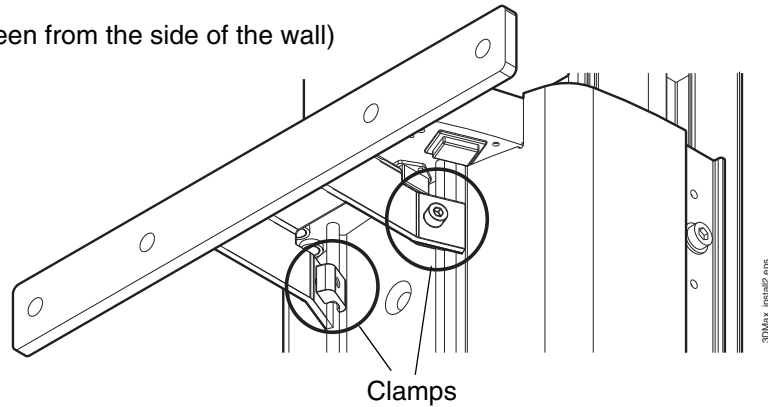
Use four mounting screws (instead of two) if you use smaller anchors and/or screws than recommended.

If needed, place protective caps (included in the delivery) on the lag screws.



Now carefully move the X-ray unit against the wall bracket. Attach the wall bracket to the X-ray unit by tightening the screws of the wall bracket clamps. The wall bracket clamps must press firmly against the guide rails.

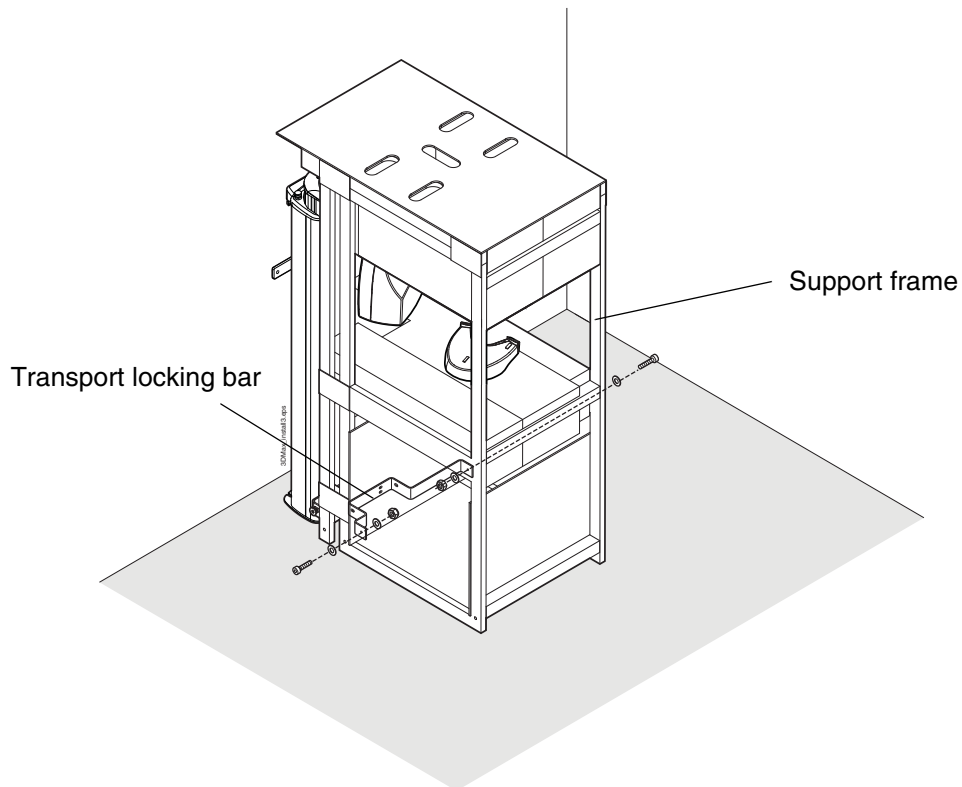
(view as seen from the side of the wall)



NOTE You can attach the wall bracket to the X-ray unit **BEFORE** attaching the wall bracket to the wall. Make sure that you position the bracket at the correct height (approx. 1250 mm (49.2 in.) from the floor).

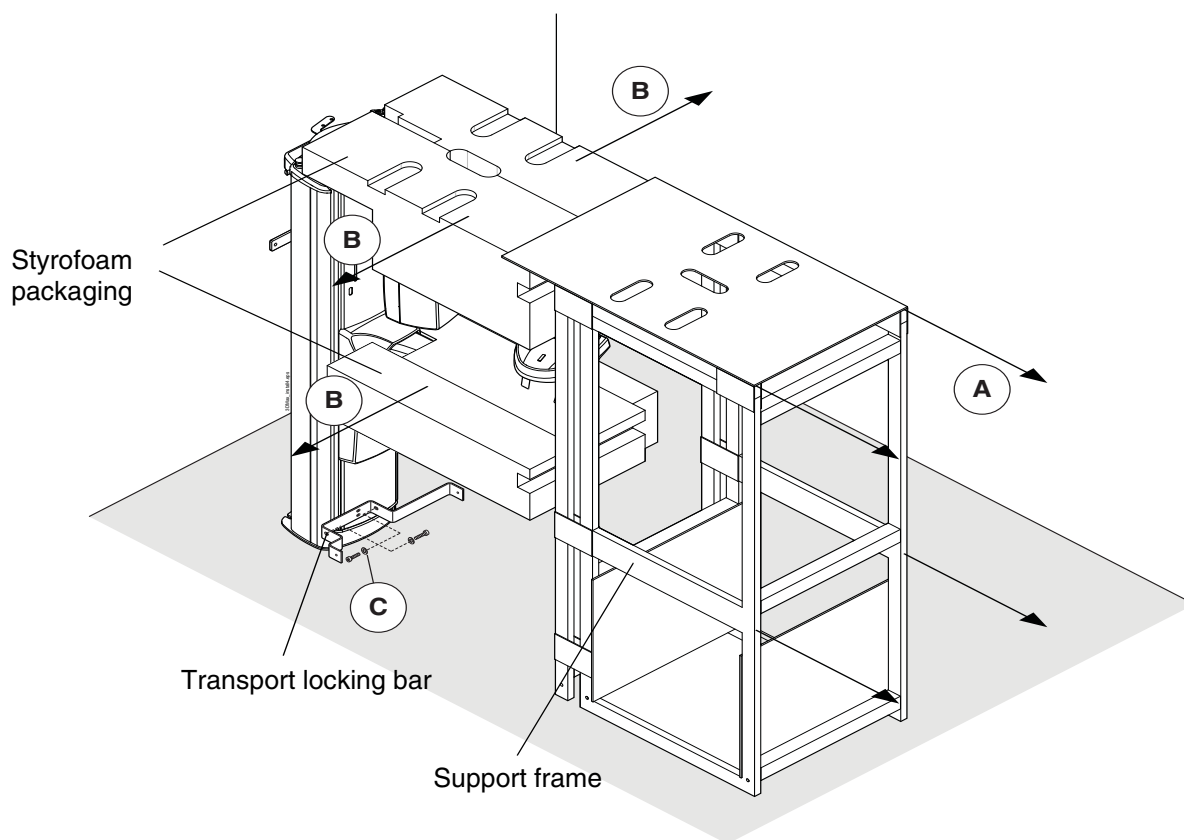
NOTE If needed, use cover plugs (included in the delivery) to close unneeded holes in the wall bracket.

Then unscrew the two screws that attach the transport locking bar to the support frame.

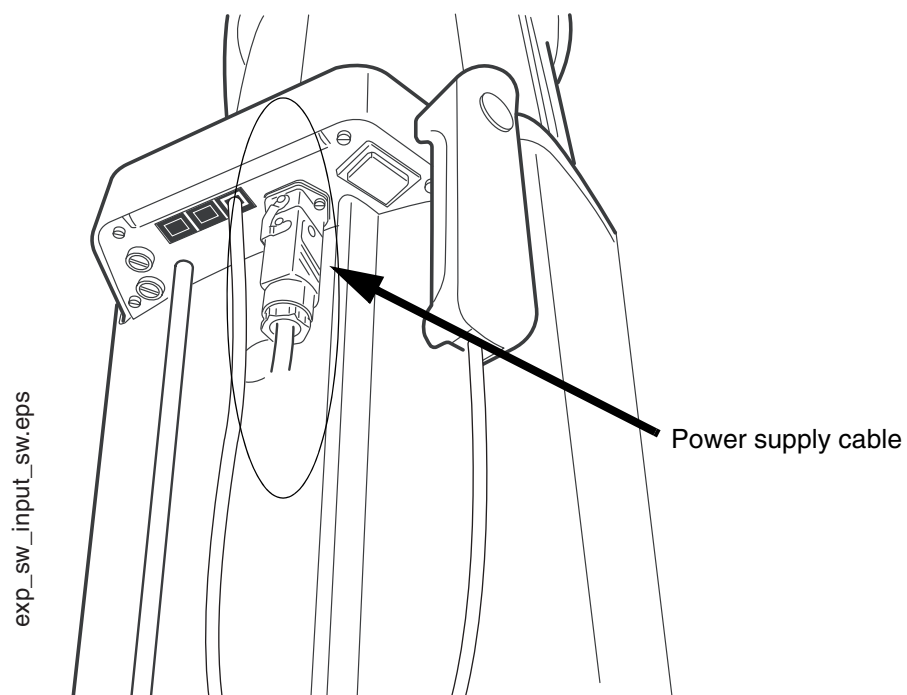


INSTALLING THE X-RAY UNIT

You can now remove the support frame (A) and the styrofoam packaging (B).
Unscrew the screws that hold the transport locking bar in position (C).



Connect the power supply cable to the terminal on the underside of the stationary column top.
Connect the plug end of the cable to a socket with suitable voltage.



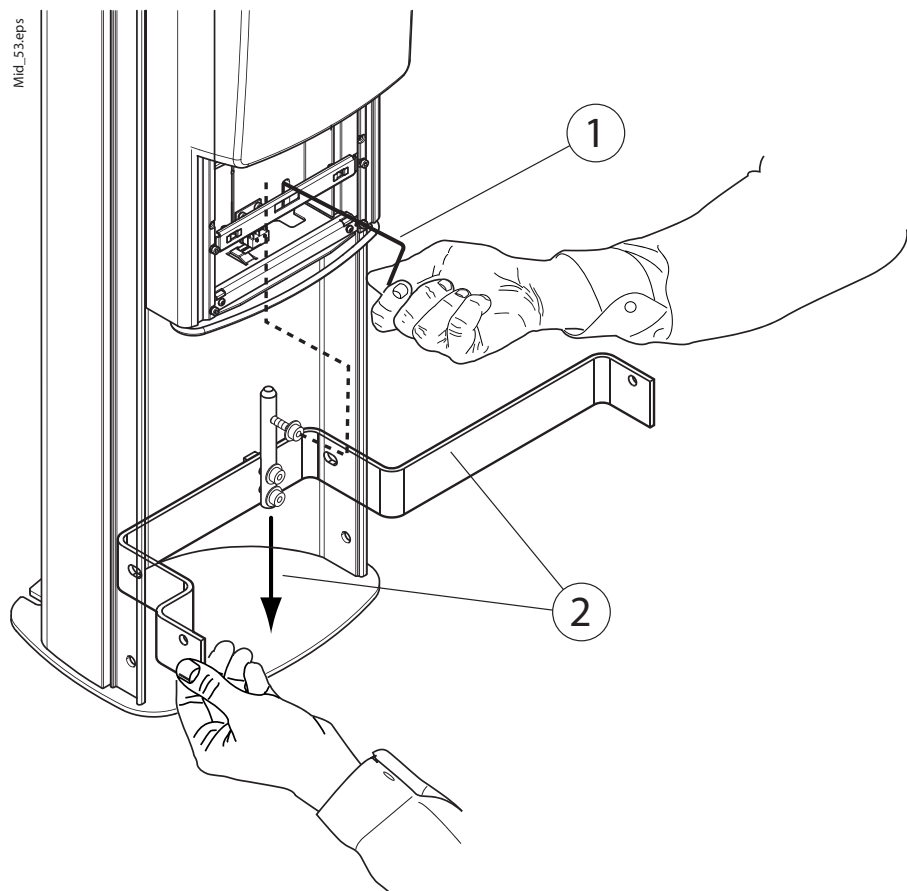
Switch the X-ray unit on. The on/off switch is located on the underside of the stationary column top.

Press the up arrow button to move the X-ray unit upwards so that you can remove the transport locking bar.

Height adjusting buttons:



Remove the screw that attaches the transport locking bar to the column (1). Remove the transport locking bar (2).



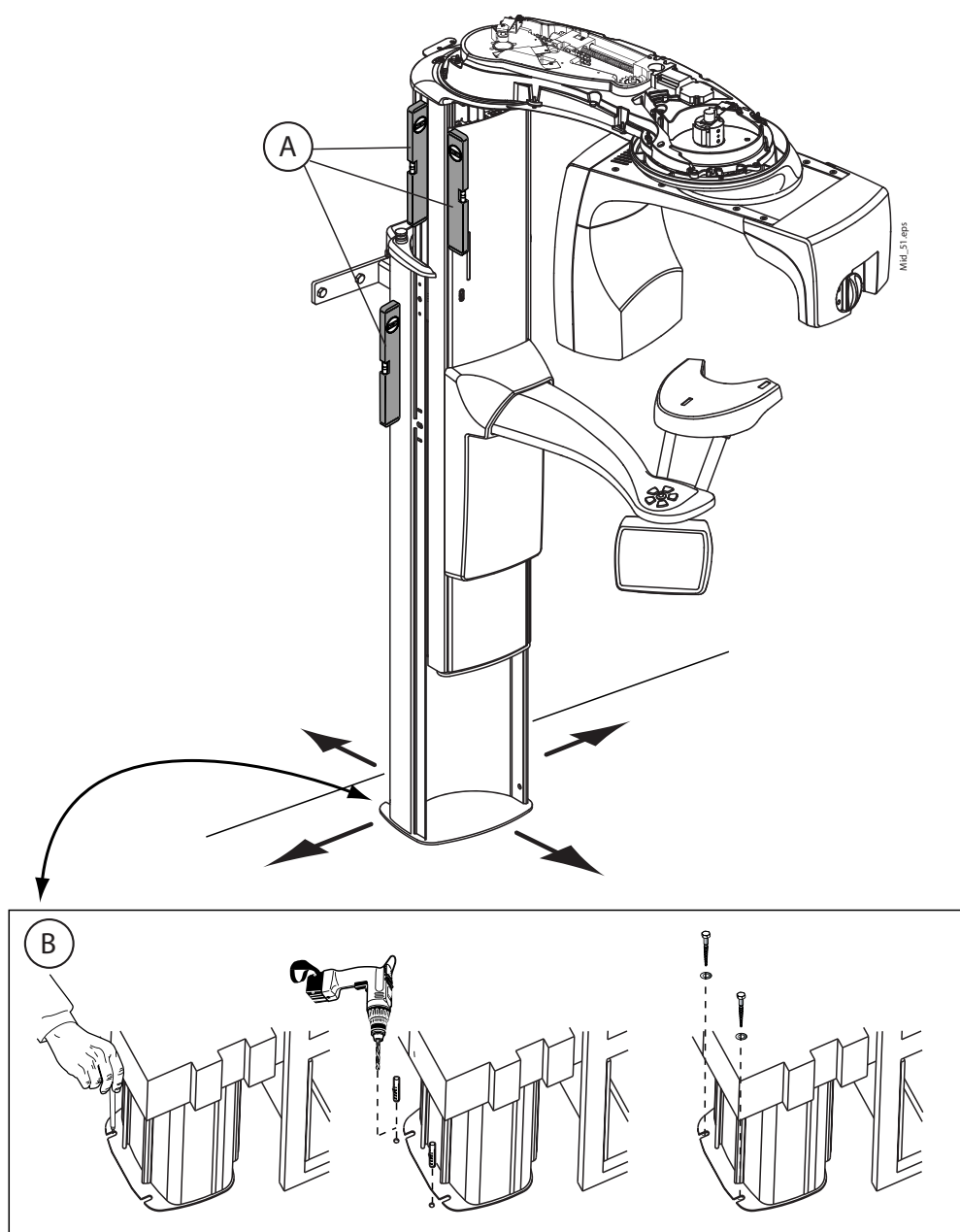
6.2 Attaching the X-ray unit to the floor

NOTE The X-ray unit must be attached to the wall with at least one wall bracket. If only one wall bracket is used, the X-ray unit must be attached to the floor as well. If the X-ray unit is not attached to the floor, a second wall bracket must be used (see section 6.3 “Attaching the second wall bracket” on page 19).

Use a spirit level to ensure that the column is vertical (A). If you have to make adjustments move the base of the column. Mark the position of the fastening holes on the floor (B).

If the floor is made of concrete or brick, use the 8x50 DIN 571 lag screws and the 10x50 expansion anchors. Drill two securing holes ($\varnothing 10$ mm (0.4 in.), 45-50 mm (1.9 in.) in depth) and insert the expansion anchors into the holes.

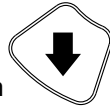
If the floor is made of wood, use the 8x50 DIN 571 lag screws. Do not use expansion anchors with wooden floor. Drill two securing holes ($\varnothing 5$ mm (0.2 in.), 45-50 mm (1.9 in.) in depth) for the mounting screws.



Ensure that the telescopic column moves smoothly. To do this, move the column from the lowest position to the uppermost position a couple of times.

Height adjusting buttons:

Down



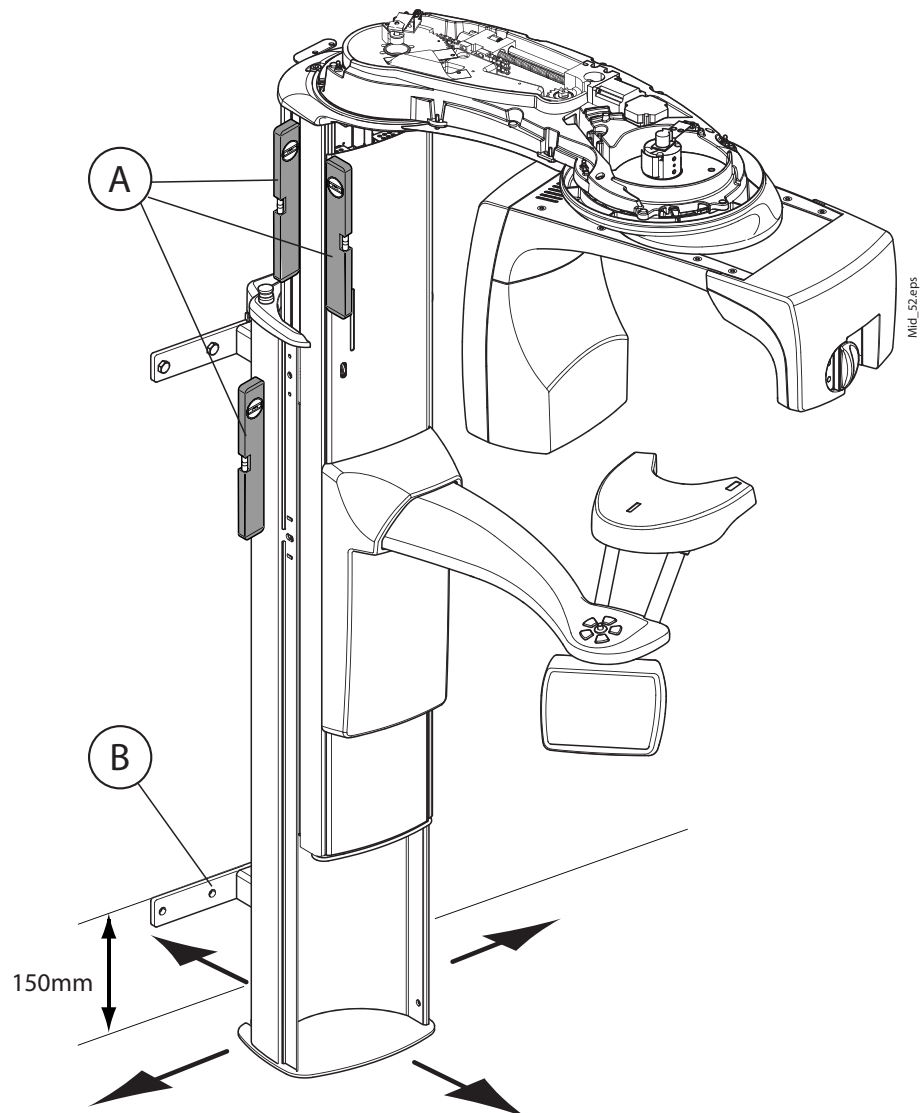
Up

If needed, adjust the telescopic column position as described in section 6.6 “Adjusting the telescopic column position” on page 23.

6.3 Attaching the second wall bracket

Use a spirit level to make sure that the column is vertical. If you have to make adjustments move the base of the column. Mark the position of the wall bracket fastening holes and attach the second bracket to the wall as described in section 6.1 “Attaching the X-ray unit to the wall” on page 14.

NOTE Make sure that you position the bracket at the correct height (approx. 150 mm (6 in.) from the floor).



INSTALLING THE X-RAY UNIT

Ensure that the telescopic column moves smoothly. To do this, move the column from the lowest position to the uppermost position a couple of times.

Height adjusting buttons:

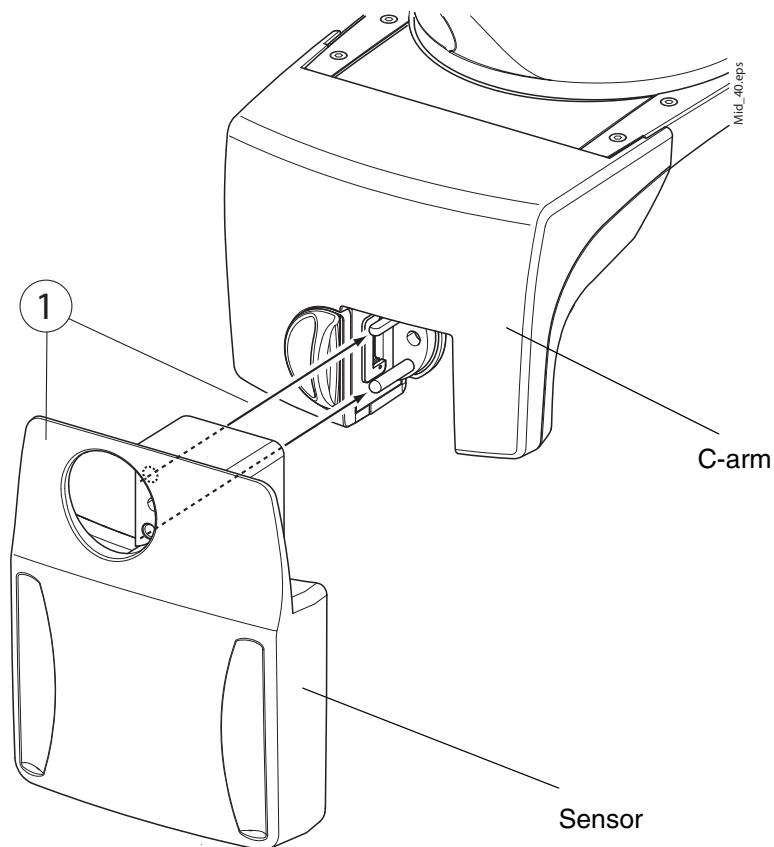


If needed, adjust the telescopic column position as described in section 6.6 “Adjusting the telescopic column position” on page 23.

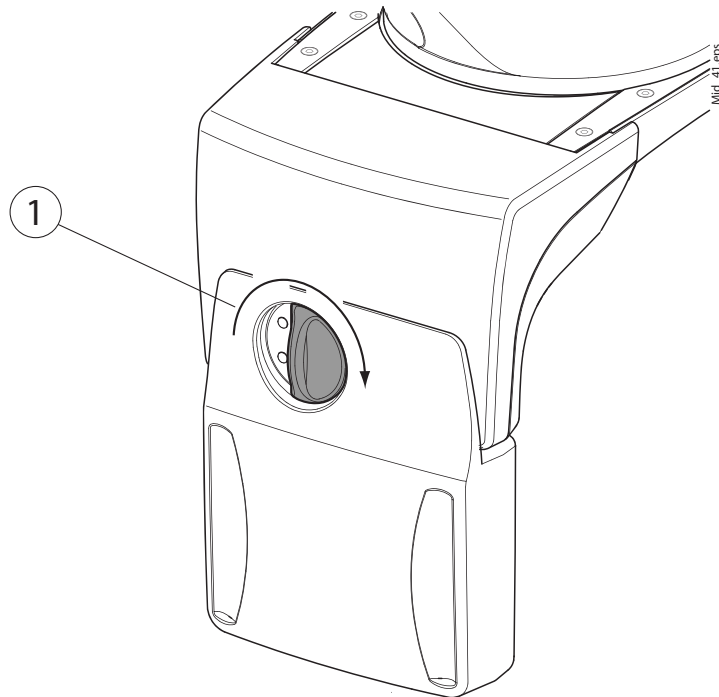
6.4 Attaching the 3D Mid sensor

NOTE Make sure that the X-ray unit is switched off.

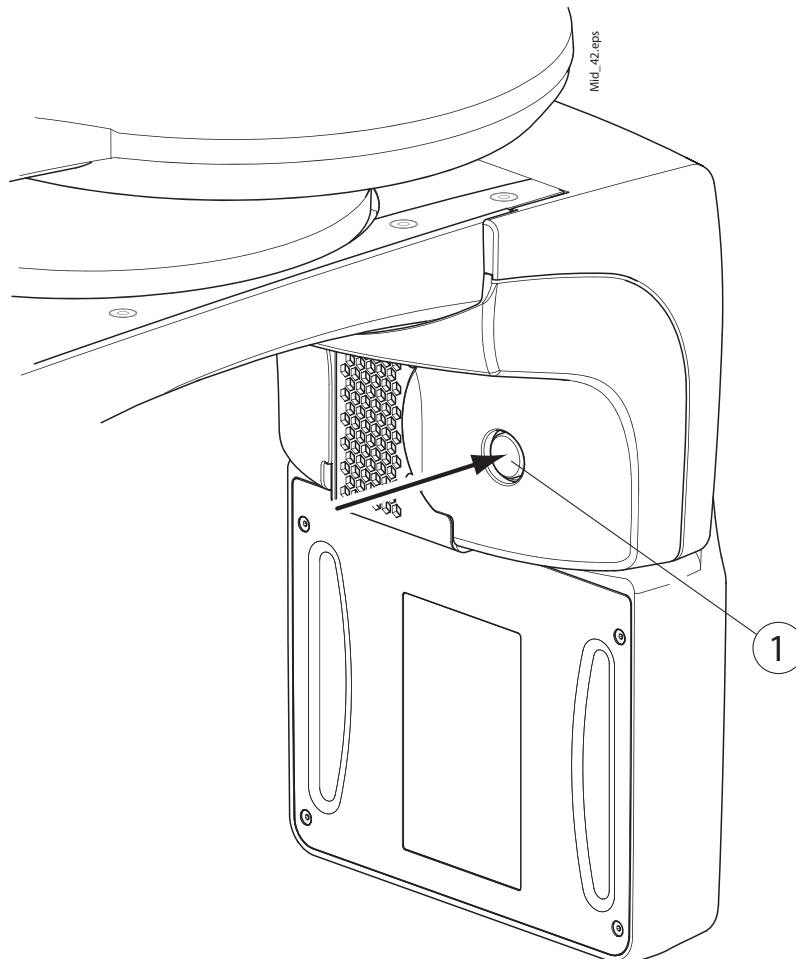
Push the sensor head onto the connector on the C-arm (1).



Turn the locking knob over the fastening mechanism (1). This will secure the sensor head in position.

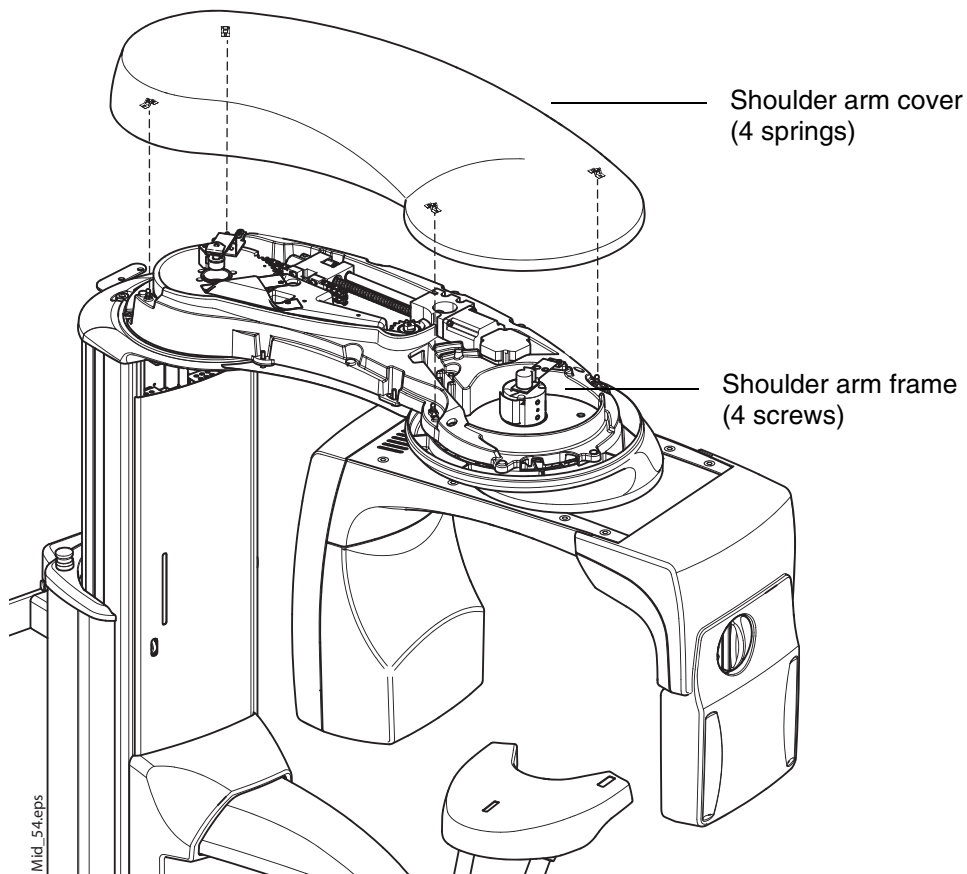


Push in the button of the C-arm electrical connector (1) on the other side to secure the sensor head in position. This will make the electrical connection between the sensor head and C-arm.



6.5 Attaching the shoulder arm cover

The shoulder arm cover is attached to the shoulder arm frame with mounting springs. Press the shoulder arm cover into position so that the mounting springs located on the underside of the cover hit the screws on the shoulder arm frame.



6.6 Adjusting the telescopic column position

NOTE Attach the sensor to the C-arm before you adjust the telescopic column position. Refer to section 6.4 “Attaching the 3D Mid sensor” on page 20.

Use a spirit level to make sure that the telescopic column is positioned parallel with the stationary column (sideways and in depth) (1). If the columns are not positioned parallel, adjust the position of the telescopic column as follows.

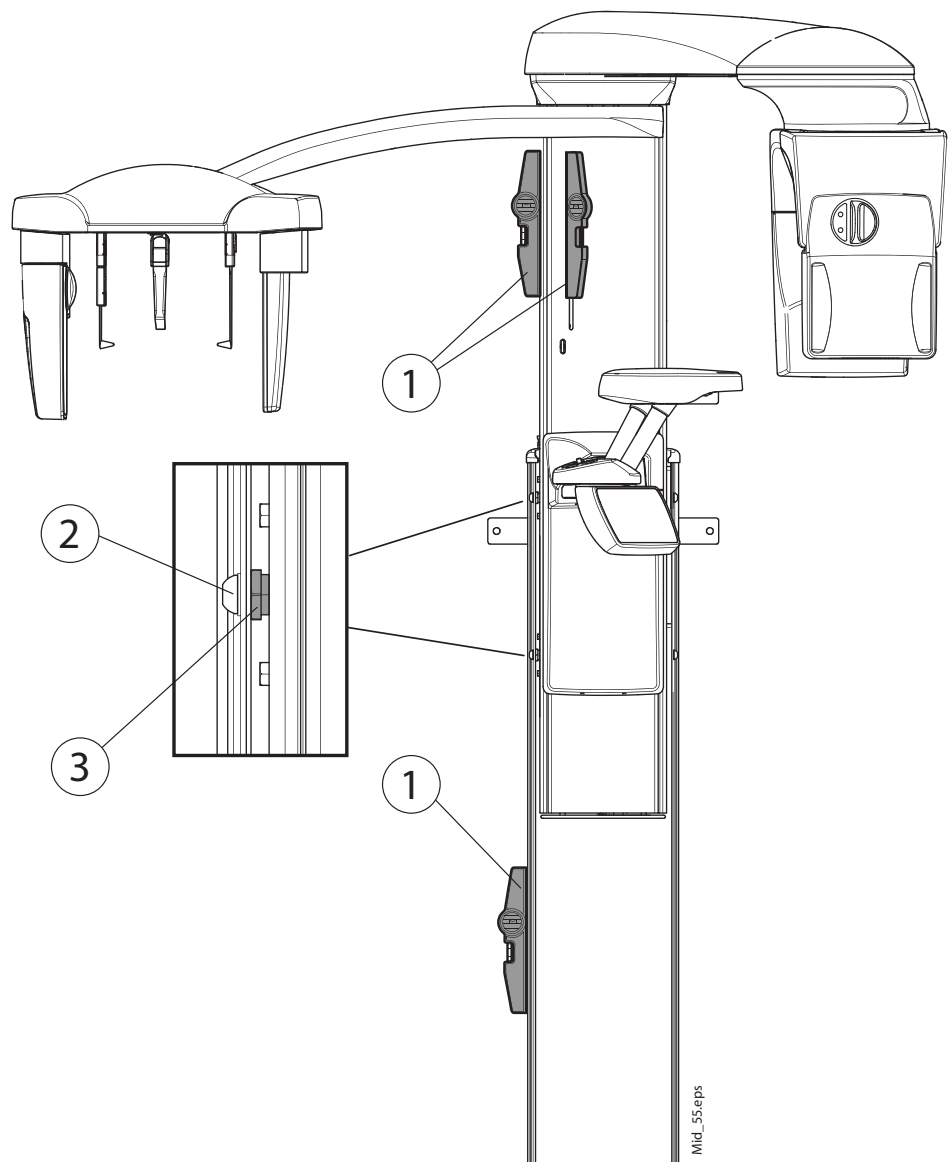
Switch the X-ray unit on. Use the up arrow button to move the X-ray unit to the position shown below.

Height adjusting buttons:



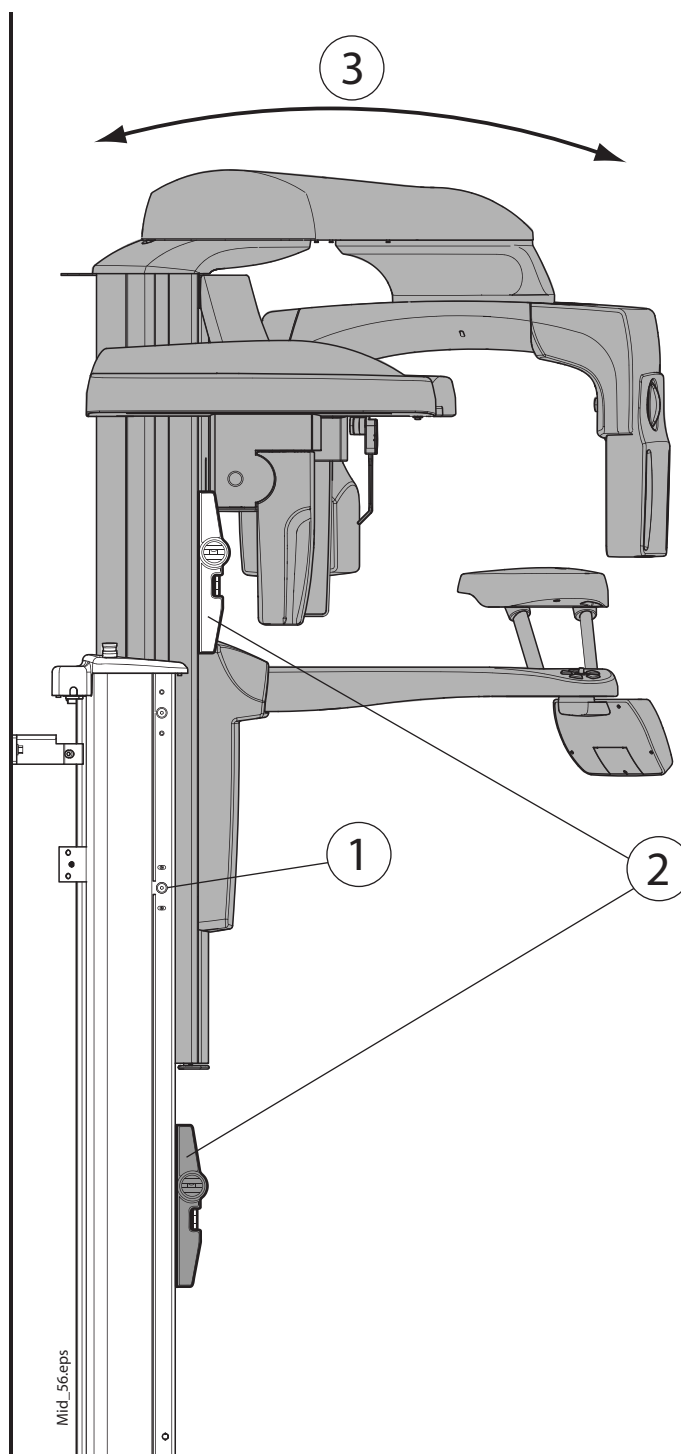
To adjust the sideways position, first loosen the two screws (2) on the left side of the column (as seen from the front). Then turn the nuts (3) located between the columns until the gap on the left side is the same size as the gap on the right, and the telescopic column is positioned parallel with the stationary column.

You can then tighten the upper screw.



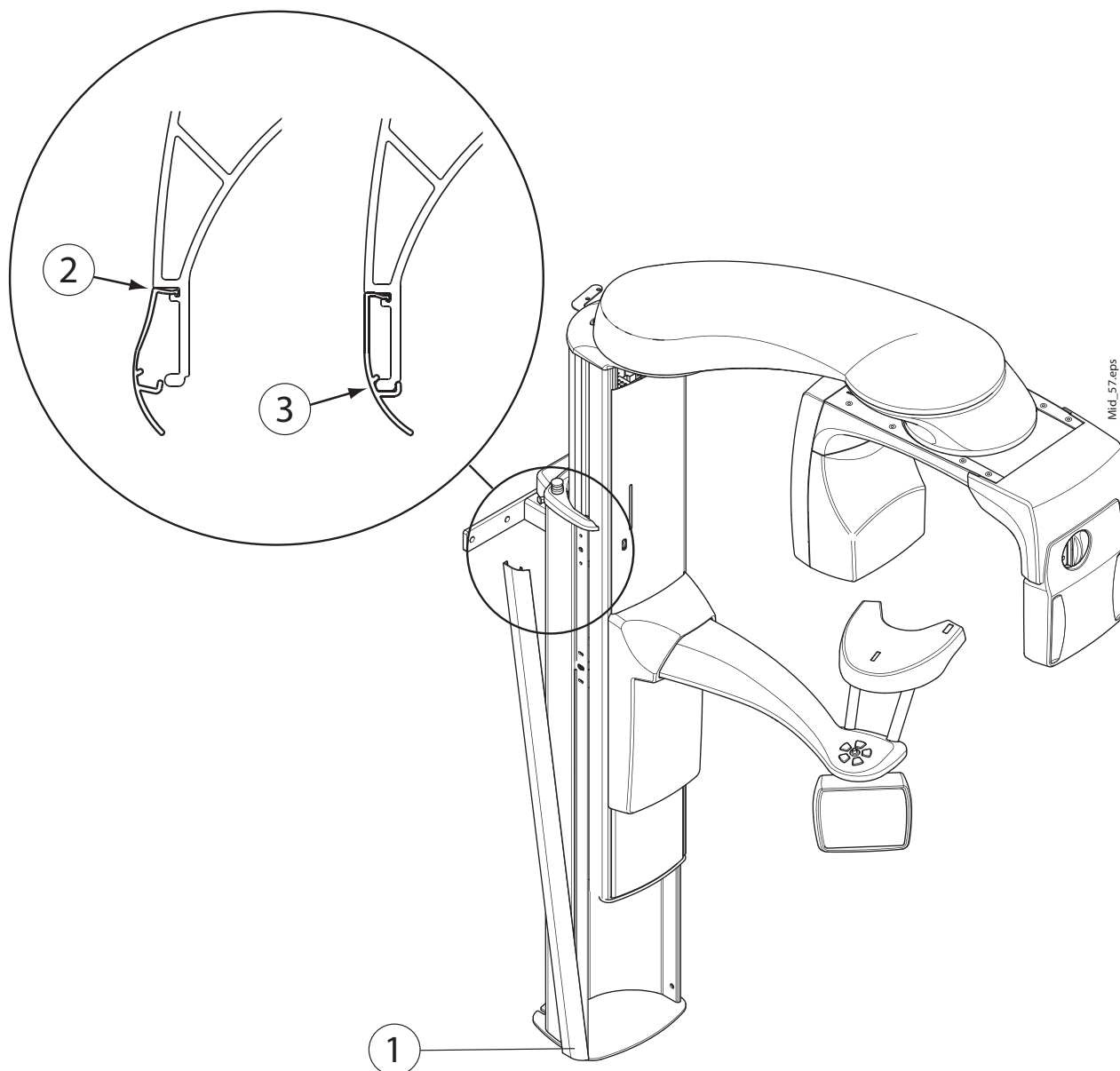
INSTALLING THE X-RAY UNIT

To adjust the column position in depth, loosen the lower screws (1) on both sides of the stationary column. Use a spirit level to check the column position (2) and manually move the telescopic column so that it is positioned parallel with the stationary column (3).
Then tighten both screws.



6.7 Attaching the side covers

Starting from the bottom (1), press the back edge of the side cover into the groove in the stationary column as shown (2). Continue to the top. Then attach the front edge (3).



Mid_57.eps

7 INSTALLING THE EXPOSURE SWITCH

NOTE The exposure switch must be located in a position that satisfies the local radiation safety regulations with regards to operator safety and the shielding of X-ray equipment. The exposure switch can be mounted on the wall, or it can be hung from the hook provided on the stationary column top if a protected area is within reach.

NOTE The wiring options for a remote installation (European and US versions) are shown in section 12 “DIAGRAMS” on page 61.

CAUTION *Only the Planmeca cross connection spiral cable (Planmeca part no. 10001193) can be used between the X-ray unit and the exposure switch. This cable can be lengthened with an RJ12 Coupler and a Modular extension cable (6wire with 2xRJ12).*

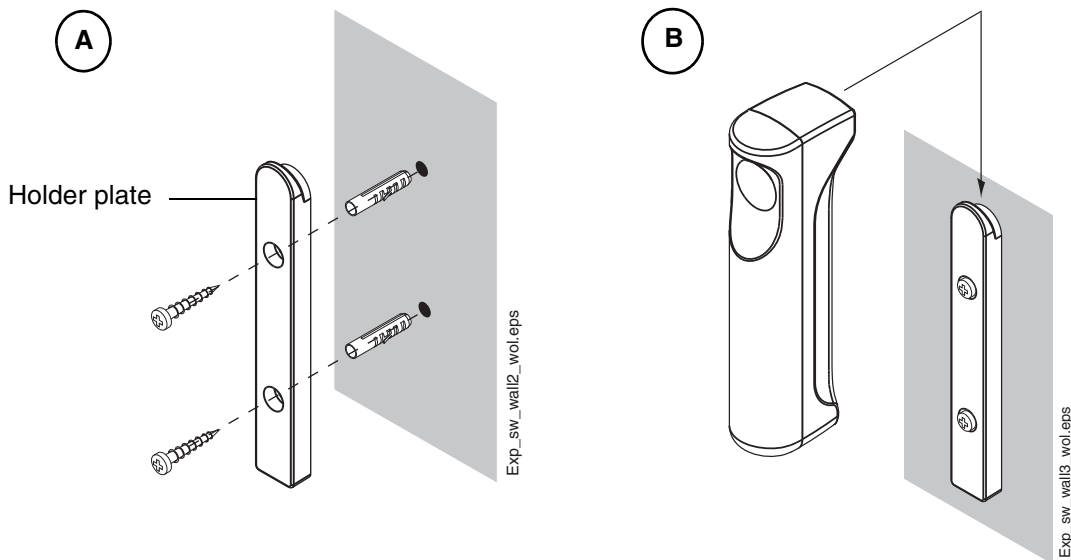
7.1 Movable exposure switch

Use the holder plate to mark the position of the exposure switch.

If the wall is made of concrete or brick, use the 4x30 screws and the 6x30 expansion anchors. Drill $\varnothing 6\text{mm}$ (0.23 in.), 20 mm (0.8 in.) in depth, securing holes and place the expansion anchors into the holes.

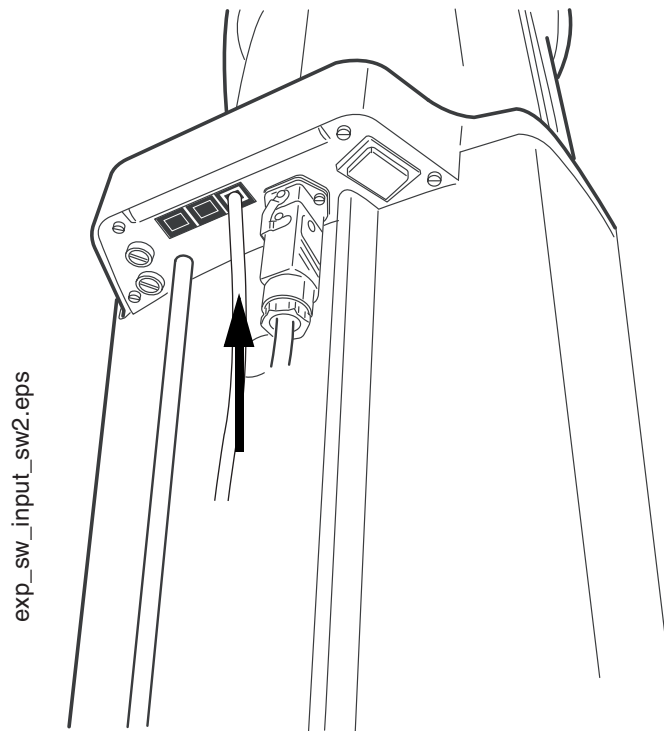
If the wall is made of wood, use the 4x30 screws. Do not use the expansion anchors with wooden wall. Drill $\varnothing 3\text{ mm}$ (0.11 in.), 20 mm (0.8 in.) in depth, holes for the attachment screws.

Attach the holder plate to the wall with the two attachment screws. The exposure switch can then be positioned on the holder plate.



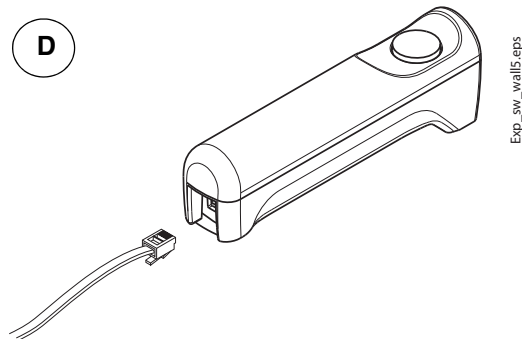
Connect the exposure switch cable to the right hand side terminal (marked “EXP”) on the underside of the stationary column top.

C



Connect the other cable end to the exposure switch.

D



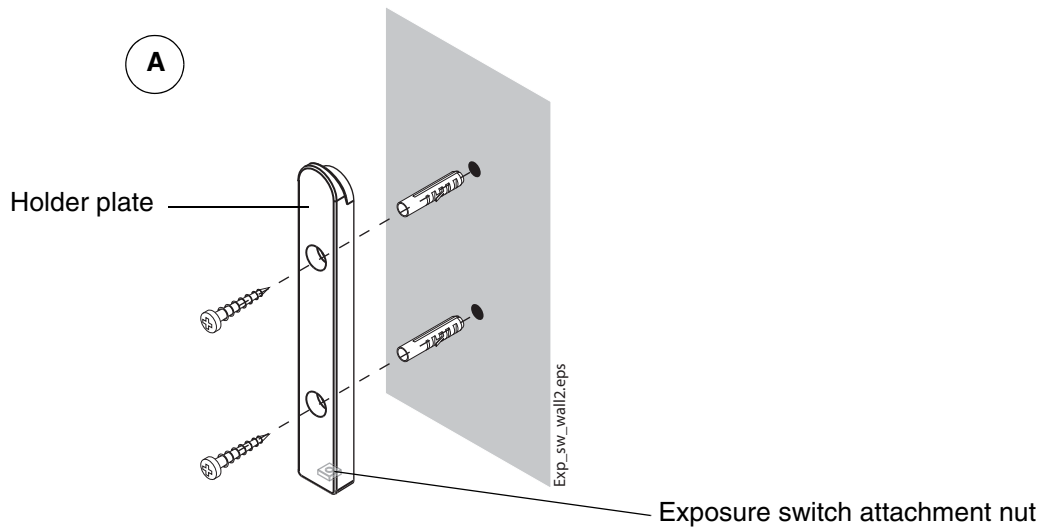
7.2 Stationary exposure switch

Use the holder plate to mark the position of the exposure switch.

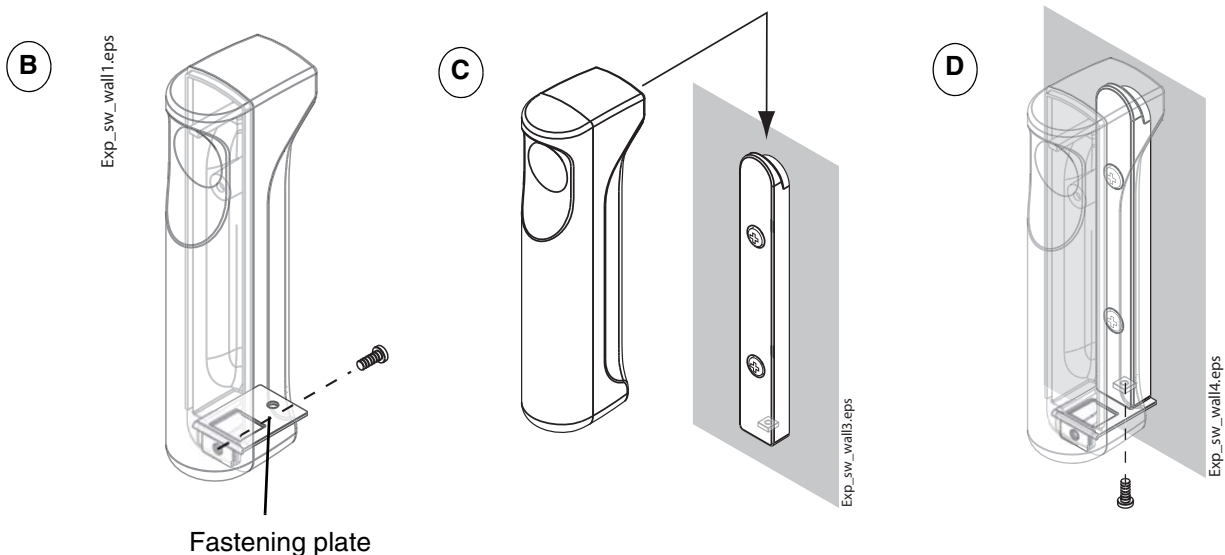
If the wall is made of concrete or brick, use the 4x30 screws and the 6x30 expansion anchors. Drill $\varnothing 6\text{mm}$ (0.23 in.), 20 mm (0.8 in.) in depth, securing holes and place the expansion anchors into the holes.

If the wall is made of wood, use the 4x30 screws. Do not use the expansion anchors with wooden wall. Drill $\varnothing 3\text{ mm}$ (0.11 in.), 20 mm (0.8 in.) in depth, holes for the attachment screws.

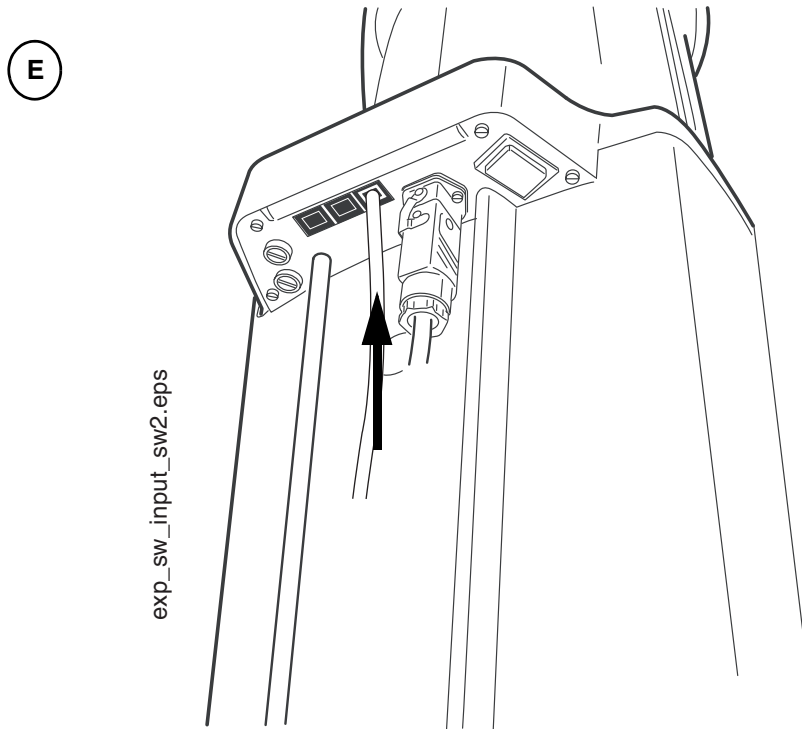
Make sure that the exposure switch attachment nut is in position at the lower end of the holder plate. Attach the holder plate to the wall with the two attachment screws.



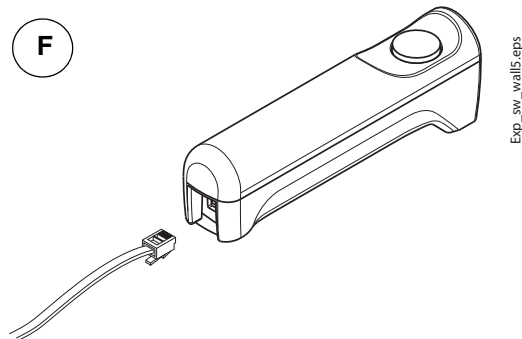
Attach the fastening plate to the exposure switch with an EJOT PT 30x8 WN1451 screw. The exposure switch can now be positioned on the holder plate. Then attach the exposure switch to the holder plate with an M3x10 DIN 912 screw.



Connect the exposure switch cable to the right hand side terminal (marked “EXP”) on the underside of the stationary column top.



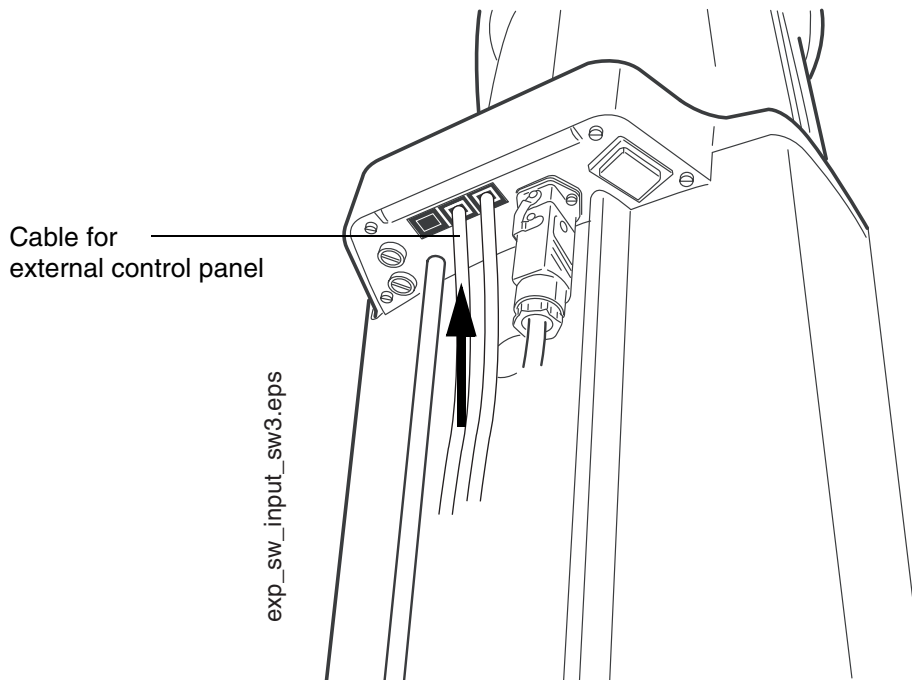
Connect the other cable end to the exposure switch.



8 INSTALLING THE EXTERNAL CONTROL PANEL (OPTIONAL)

NOTE Make sure that the X-ray unit is switched off before connecting/disconnecting the cable of the external control panel to the X-ray unit.

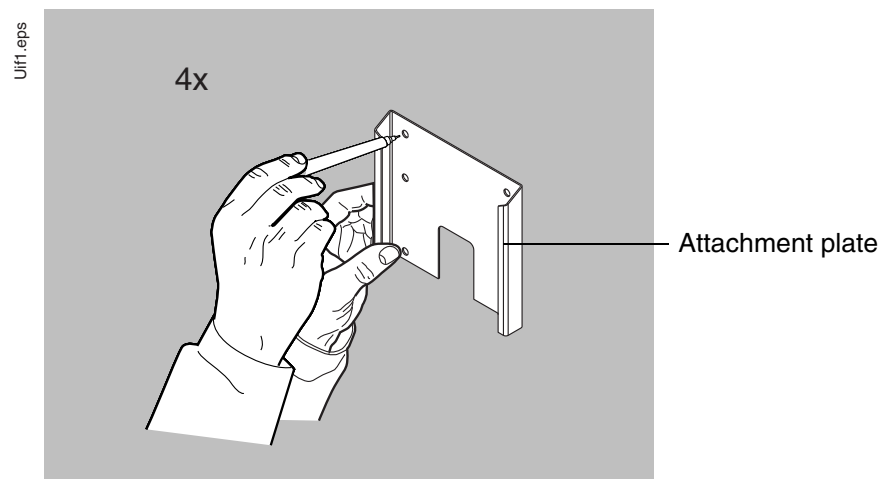
Connect the cable of the external control panel (RJ-45 UTP, max. length 15 m) to the middle terminal (marked “Plancan”) on the underside of the stationary column top.



8.1 Attaching the control panel to the wall

NOTE If you are using a wall socket, follow the instructions given in section 8.2 “Attaching the control panel to a wall socket (USA)” on page 33.

Use the attachment plate as a template and mark the positions where the holes for the four attaching screws will be drilled.

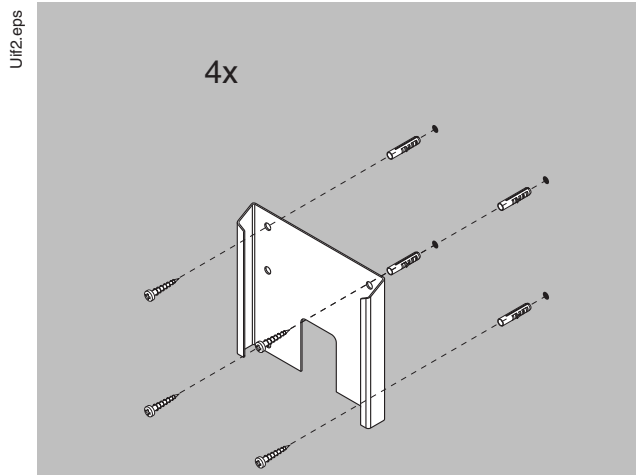


INSTALLING THE EXTERNAL CONTROL PANEL (OPTIONAL)

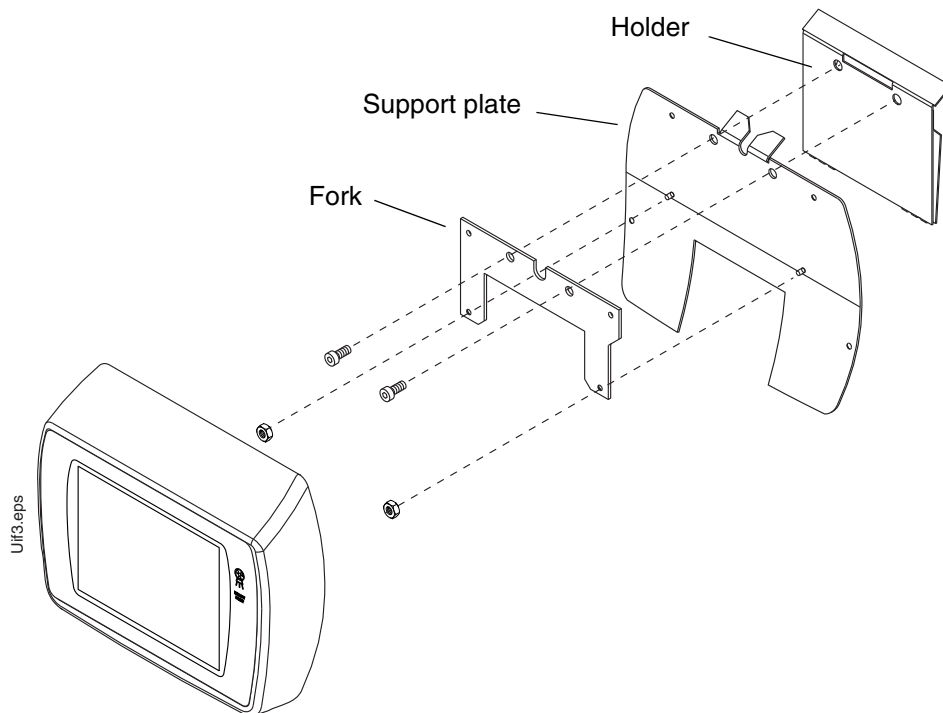
If the wall is made of concrete or brick, use 4x30 screws and 6x30 expansion anchors. Drill $\varnothing 6\text{mm}$ (0.23 in.), 20 mm (0.8 in.) in depth, securing holes and insert the expansion anchors into the holes.

If the wall is made of wood, use 4x30 screws. Do not use expansion anchors with wooden wall. Drill $\varnothing 3\text{ mm}$ (0.11 in.), 20 mm (0.8 in.) in depth, holes for the attachment screws.

Attach the plate to the wall with the four screws.

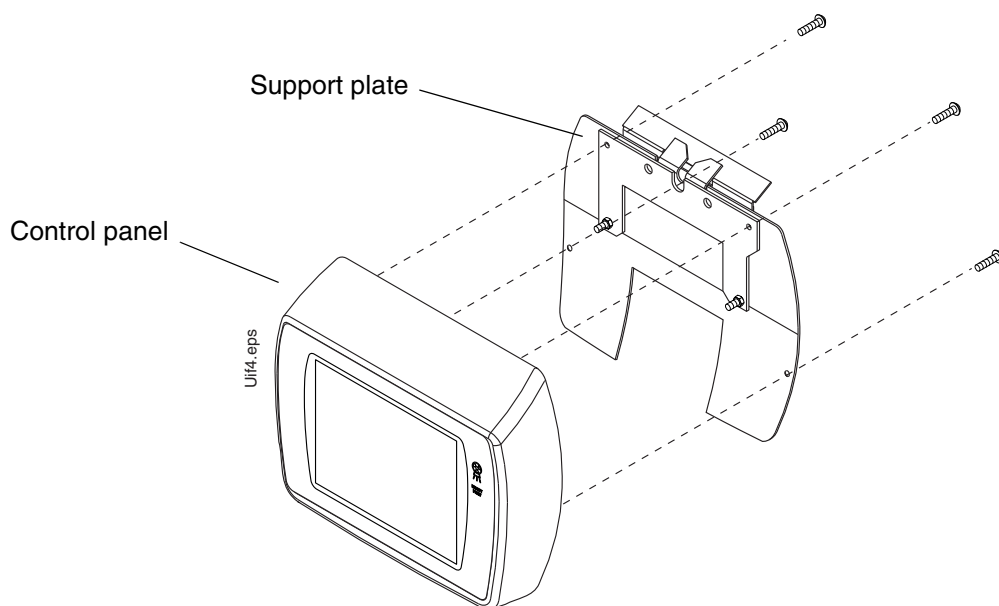


Attach the support plate and the fork to the holder with two M6x12 DIN 7984 screws. Secure the fork to the support plate with two M3 DIN 934 nuts.

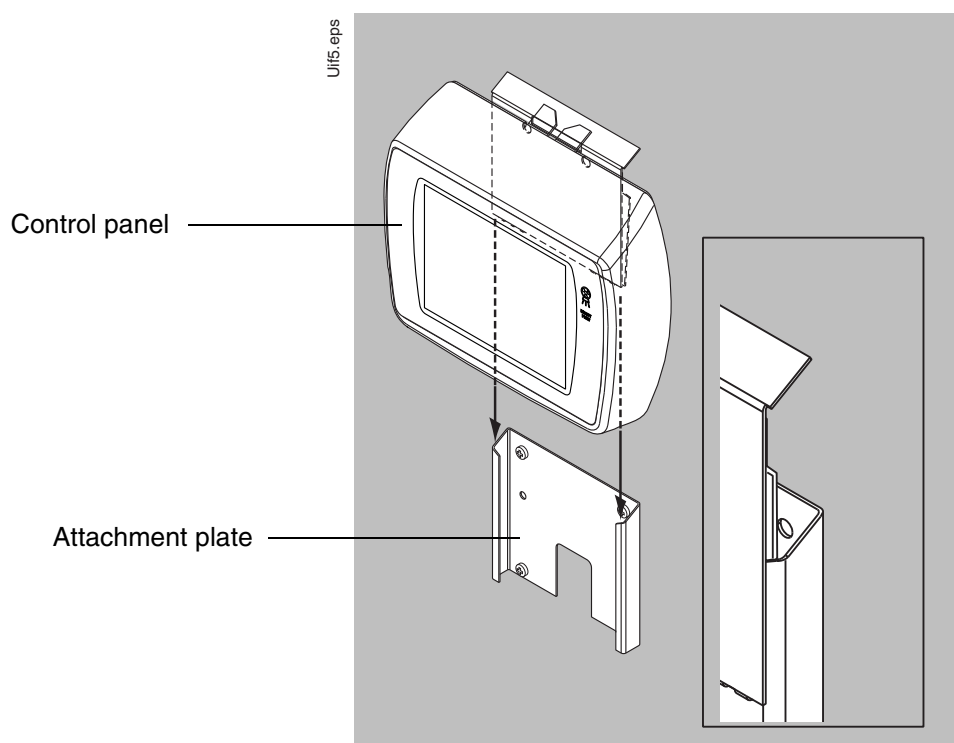


INSTALLING THE EXTERNAL CONTROL PANEL (OPTIONAL)

Attach the control panel to the support plate with four PT 3x12 rst WN1451 torx screws.



Slide the control panel onto the attachment plate as shown.

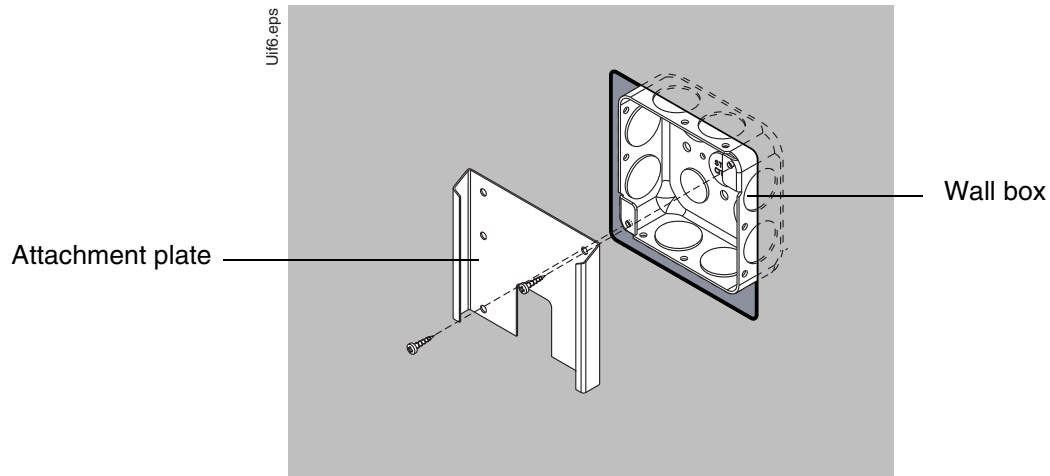


Connect the control panel cable to the terminal (marked “Plancan”) on the underside of the control panel frame.

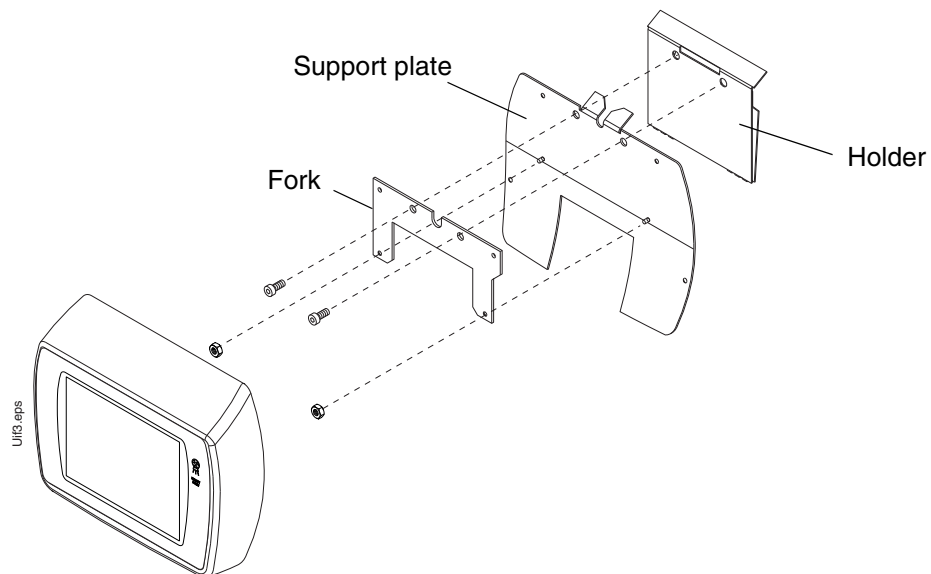
NOTE For wiring connections, see section 12 “DIAGRAMS” on page 61.

8.2 Attaching the control panel to a wall socket (USA)

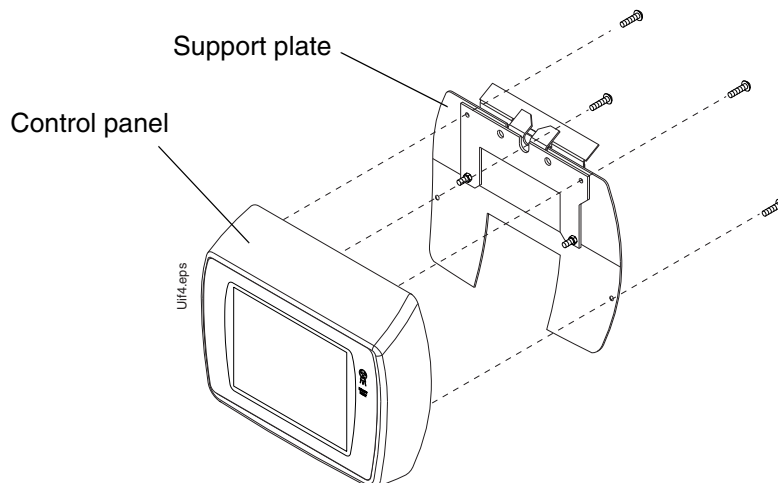
Secure the attachment plate to the wall box with two screws as shown.



Attach the support plate and the fork to the holder with two M6x12 DIN 7984 screws. Secure the fork to the support plate with two M3 DIN 934 nuts.

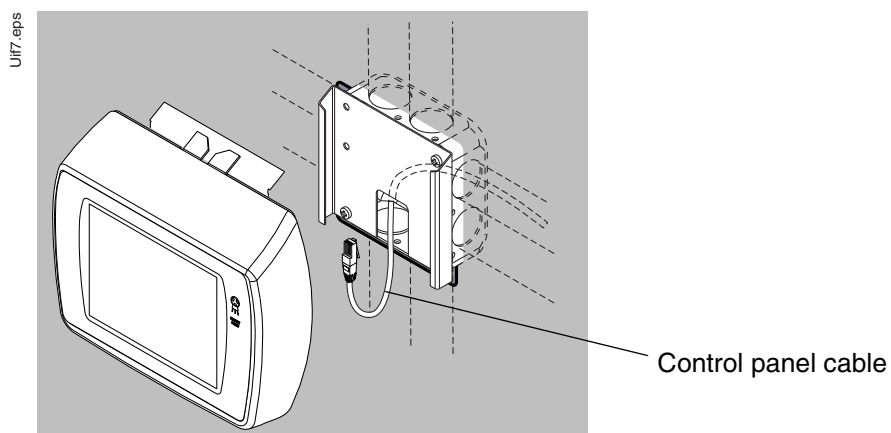


Attach the control panel to the support plate with four PT 3x12 rst WN1451 torx screws.

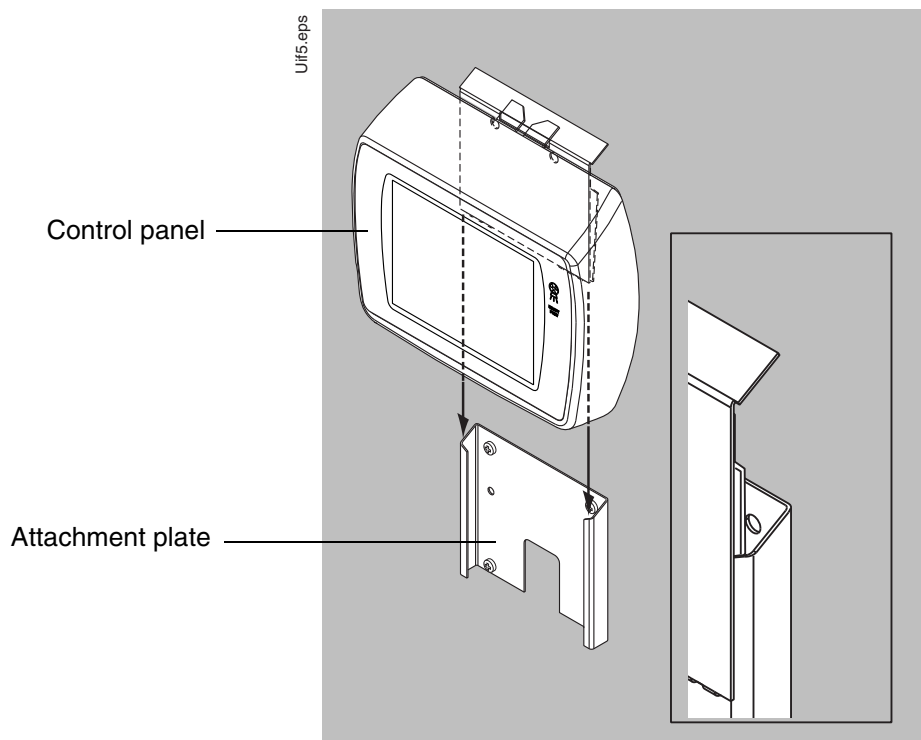


INSTALLING THE EXTERNAL CONTROL PANEL (OPTIONAL)

Route the control panel cable through the opening in the attachment plate. Connect the cable to the terminal (marked “Plancan”) on the underside of the control panel frame.



Slide the control panel onto the attachment plate as shown.

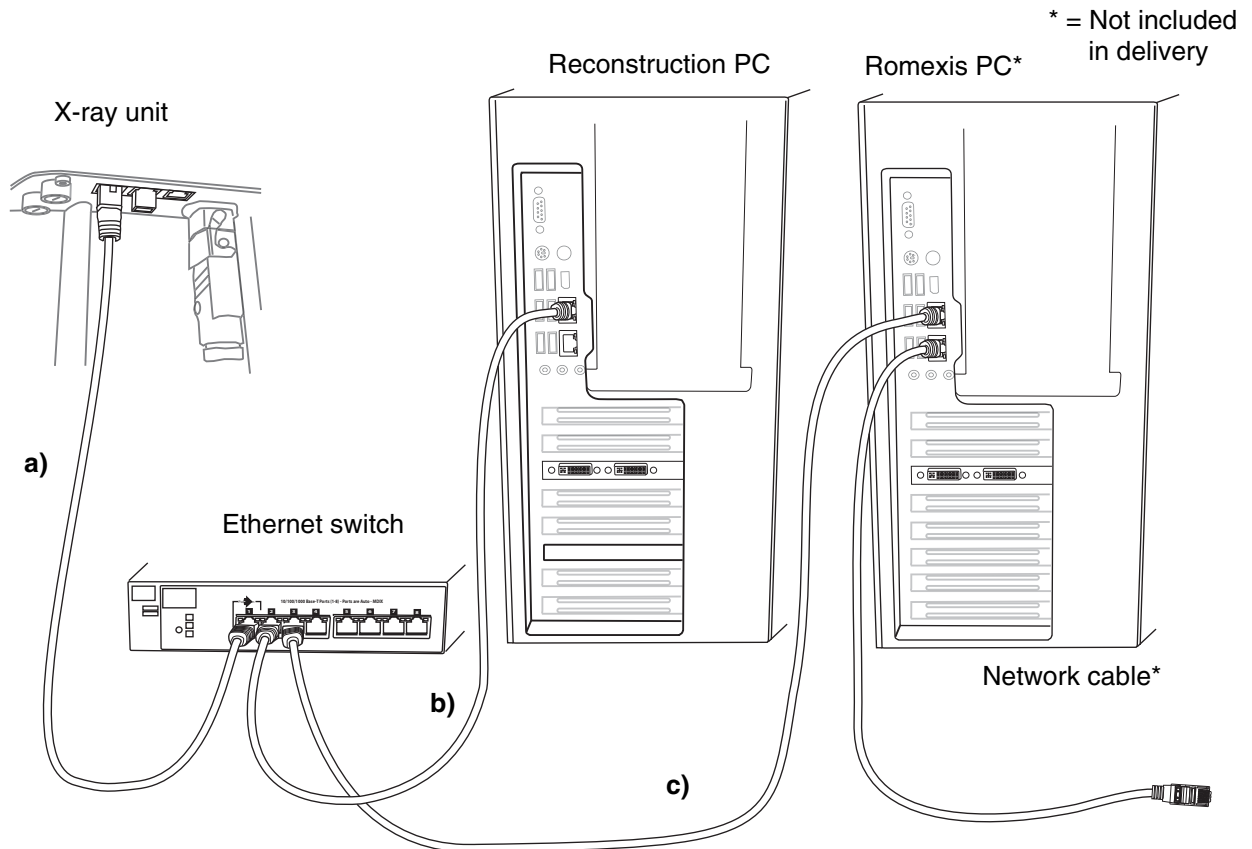


NOTE For wiring connections, see section 12 “DIAGRAMS” on page 61.

9 CONNECTING THE 3D SYSTEM

9.1 Connecting the Ethernet cables

NOTE Make sure that the X-ray unit is switched off before you connect the Ethernet cables.
Connect the cables as follows.

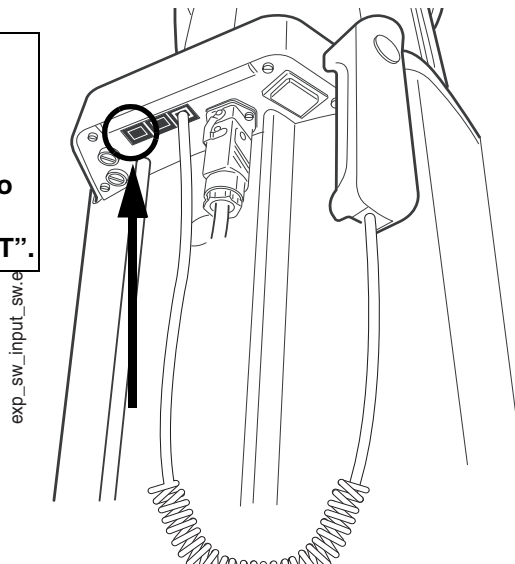


a) Use an Ethernet cable to connect the ProMax X-ray unit to the Ethernet switch.

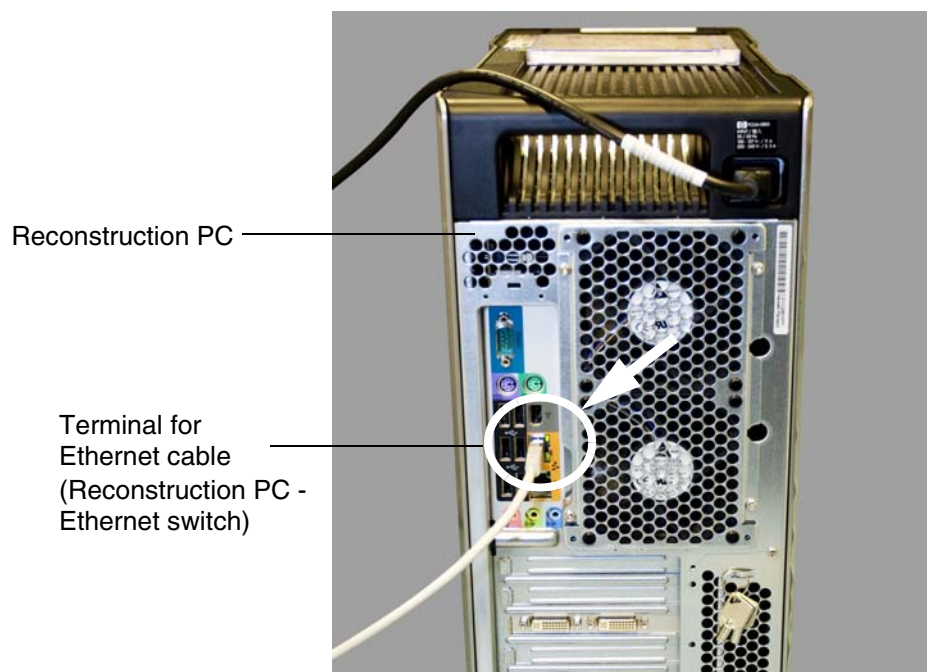
The Ethernet cable is attached to the left terminal (marked "ETHERNET") on the underside of the stationary column top.

NOTE Only an Ethernet cable can be connected to the left hand side terminal. Do not connect any other cables to this terminal.

WARNING!
Wrong connection
can cause damage!
Make sure that you
connect the cable to
the connector
marked "ETHERNET".



b) Use an Ethernet cable to connect the reconstruction PC to the Ethernet switch.



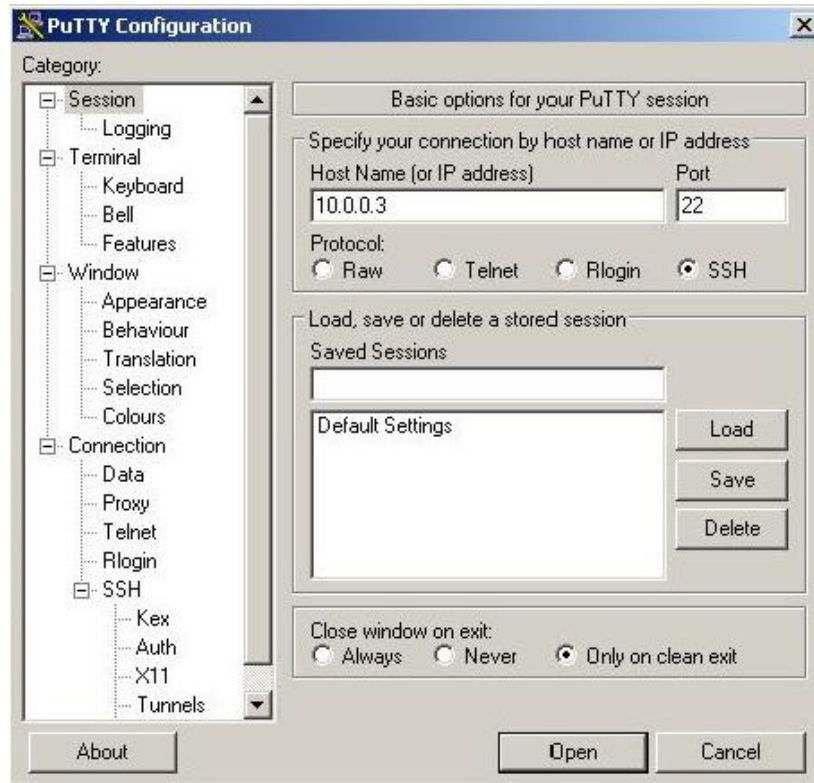
c) Use an Ethernet cable to connect the Workstation PC (Romexis PC) to the Ethernet switch.

9.2 IP Address for reconstruction PC

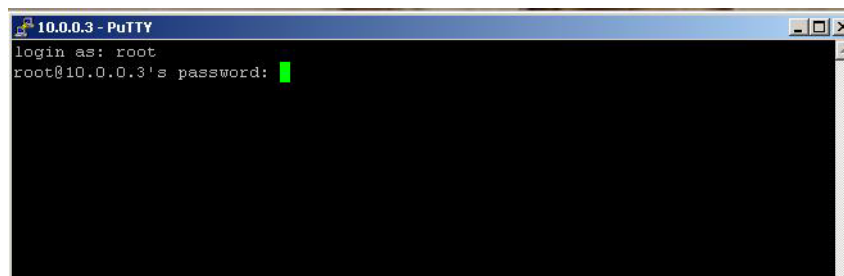
NOTE The IP address of eth0 card (for 3D Max sensor) should NOT be changed.

The reconstruction PC is equipped with two Ethernet cards. The default IP address of eth1 card (for switch) is 10.0.0.3. If this address needs to be changed, proceed as follows.

Start the Putty.exe program on the Romexis PC. The program is available on the Romexis DVD (Tools/Putty). Enter the reconstruction PC IP address in the *Host Name (or IP address)* field. Set the Port to value 22 and select SSH protocol. Click Open.



Enter the login name **root** and password **adminx**.



Type into the Terminal window **cd /etc/sysconfig/networking/devices**.

Configure the file by writing **nano ifcfg-eth1**.

```
[root@recpc:/etc/sysconfig/networking/devices]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]#  
[root@recpc /]# cd /etc/sysconfig/networking/devices  
[root@recpc devices]# ls  
ifcfg-eth0 ifcfg-eth1  
[root@recpc devices]# nano ifcfg-eth1
```

Enter the new IP address and save the changes by pressing CTRL+x.

```

root@recpc:/etc/sysconfig/networking/devices
GNU nano 1.2.4 File: ifcfg-eth1

DEVICE=eth1
HWADDR=00:18:FE:26:28:24
ONBOOT=yes
TYPE=Ethernet
BOOTPROTO=none
NETMASK=255.255.255.0
IPADDR=10.0.0.3
USERCTL=no
IPV6INIT=no
PEERDNS=yes

[ Read 10 lines ]

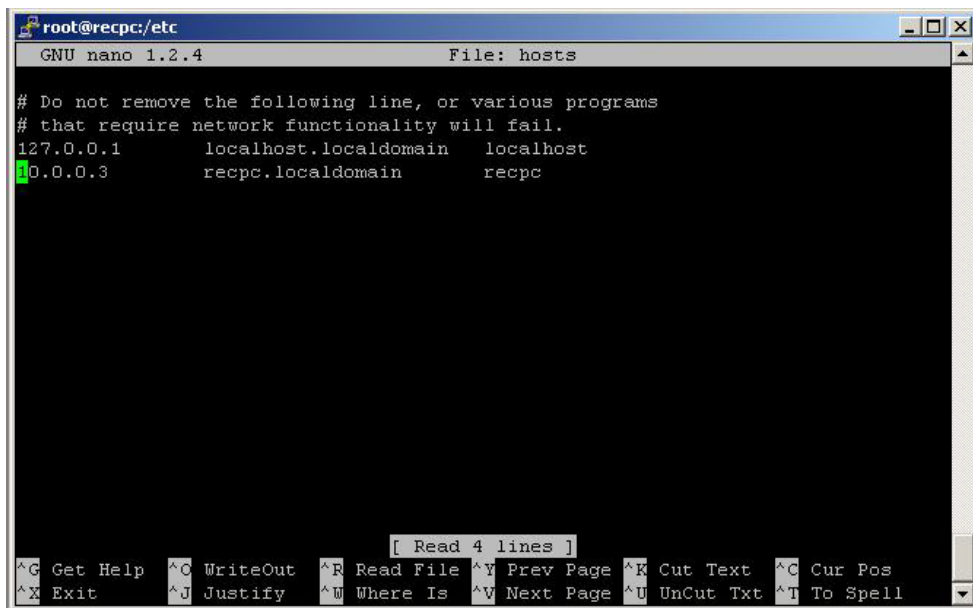
^G Get Help ^O WriteOut ^R Read File ^V Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^N Next Page ^U UnCut Txt ^T To Spell

```

You have to change the address also to the hosts file. On the command row go to the **cd /etc** and configure the file by writing **nano hosts**.

```
[root@recpc etc]#  
[root@recpc etc]#  
[root@recpc etc]#  
[root@recpc etc]# nano hosts
```

Enter the new IP address and save the changes by pressing CTRL+x.



```

root@recpc:/etc
GNU nano 1.2.4      File: hosts

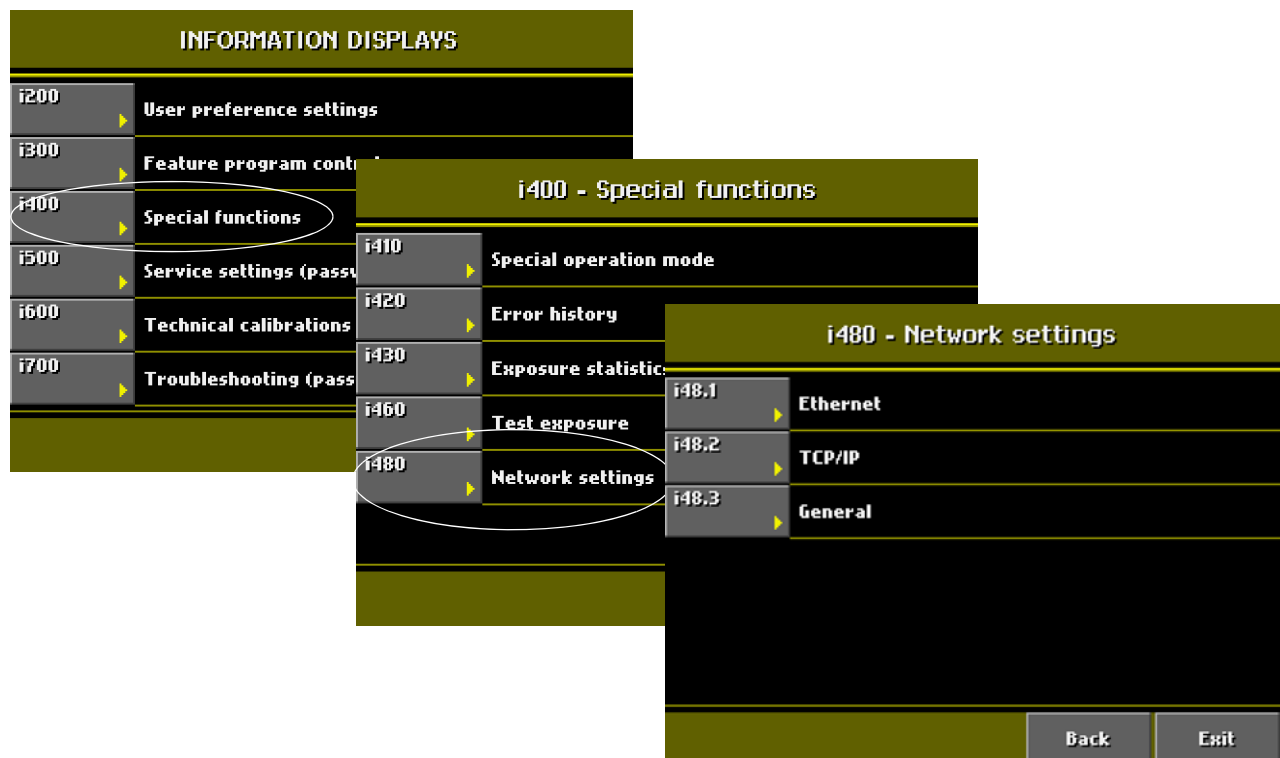
# Do not remove the following line, or various programs
# that require network functionality will fail.
127.0.0.1    localhost.localdomain    localhost
10.0.0.3     recpc.localdomain    recpc

[ Read 4 lines ]
^G Get Help  ^O WriteOut  ^R Read File ^Y Prev Page ^K Cut Text  ^C Cur Pos
^X Exit      ^J Justify   ^W Where Is ^V Next Page ^U UnCut Txt ^T To Spell

```

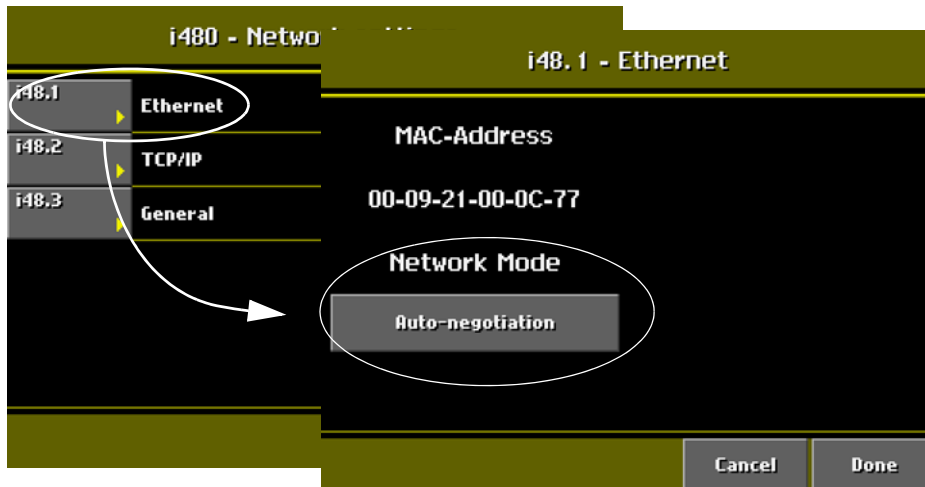
9.3 Configuring the Ethernet link for ProMax

Switch the X-ray unit on. On the X-ray unit control panel, touch the **i** field on the main display. The list of **Information displays** appears. From the list of **Information displays** select **Special functions (i400)**. Then select **Network settings** on the **Special functions** display. The display shown below will appear.



Ethernet (i48.1)

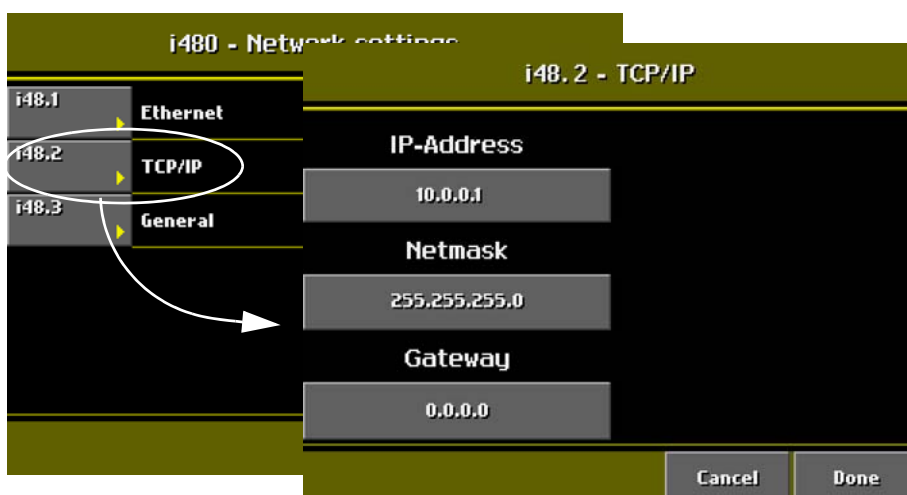
On the **Network settings (i480)** display, select the option **Ethernet (i48.1)**. The display shown below appears.



- **MAC Address**
MAC (Media Access Control) address is unit specific and it cannot be changed.
- **Network Mode**
Touch the *Network Mode* field to scroll through the available options:
 - Auto-negotiation (default setting). The data is transmitted at the highest possible speed (the Ethernet devices will autonegotiate, i.e. mutually determine, the highest speed they both support).
 - 10/100 Mb Half-duplex. The data is transmitted in both directions on a signal carrier, but not at the same time.
 - 10/100 Mb Full-duplex. The data is transmitted in both directions on a signal carrier at the same time.

TCP/IP (i48.2)

On the **Network settings (i480)** display, select the option **TCP/IP (i48.2)**. TCP/IP stands for Transmission Control Protocol / Internet Protocol. The display shown below appears.

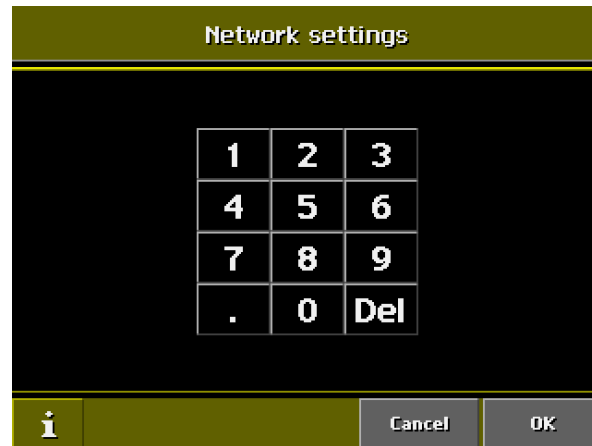


- **IP Address** - Ethernet interface IP (Internet Protocol) address
- **Netmask** - Subnet mask
- **Gateway** - Gateway IP address

NOTE In case the X-ray unit is connected to a 10/100 Base Network, the Gateway, Netmask and the ProMax IP address have to be static and specified by the local administrator to be used only for this configuration.

Refer to the IP address example shown in section “Planmeca ProMax 3D Mid system network architecture with subnet” on page 5.

The settings can be changed by touching the address field. The following window will appear. Enter the new address and save it by touching *OK*. You can use values between 0 - 255.

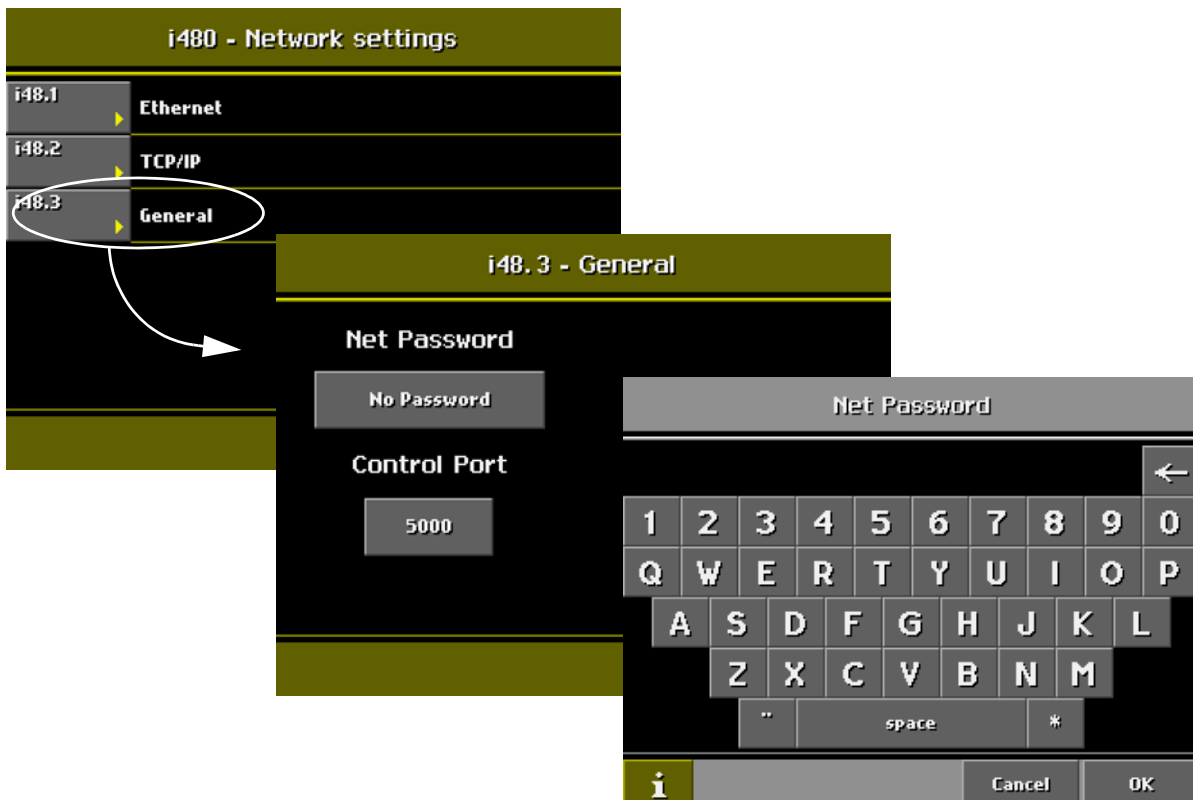


General (i48.3)

If a Net password has been set for the Ethernet link, it must be removed.

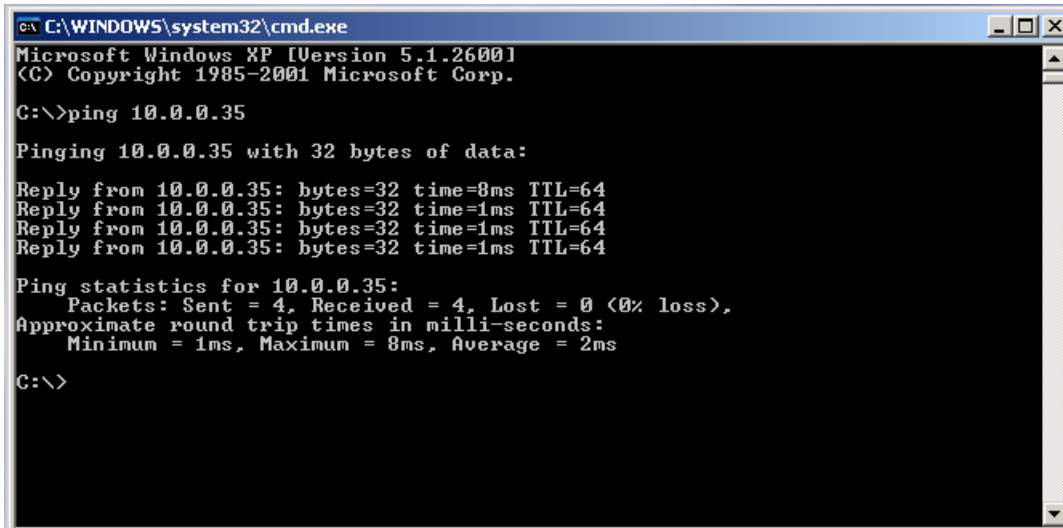
On the **Network settings (i480)** display, select the option **General (i48.3)**. The display shown below appears.

First touch the *Password Set* field. Then enter the password on the display that appears and touch *OK*.



Checking ProMax Ethernet link communication

The Ethernet link communication from the Romexis PC to the ProMax can be checked by opening the Command Prompt and executing the command “**ping <ProMax IP address>**”, e.g. **ping 10.0.0.1**.



ProMax will send a Reply packet back if the Ethernet link is up and running.

Check the connection between Romexis PC and reconstruction PC the same way.

NOTE If you do not receive a reply message (e.g. Time-out signal) the link is not working properly.

9.4 Installing the Romexis software

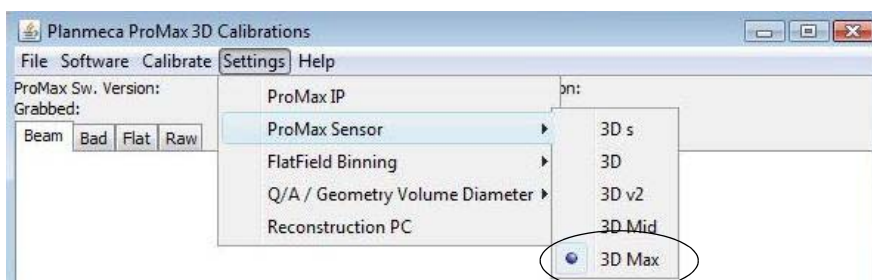
Install the software according to the instructions given in the Romexis Installation manual (publication number 10014600).

9.5 Configuring IP addresses in ProMax3D Tool

The IP addresses for ProMax and reconstruction PC must be configured also in the ProMax3D Tool program.

Start the ProMax3D Tool program.

Select the option *3D Max* from the *Settings/ProMax Sensor* menu.

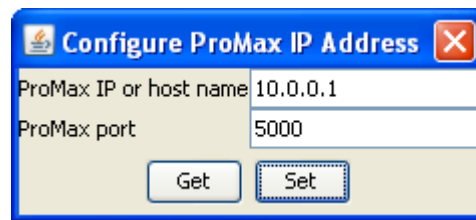


Configuring ProMax IP address

Select the option *ProMax IP* from the *Settings* menu.

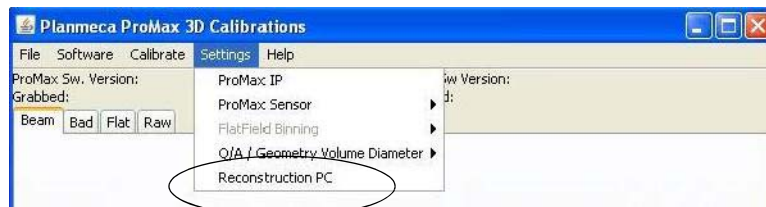


Enter the new IP address in the *Configure ProMax IP Address* window and save the setting by clicking *Set*. The port must be 5000.

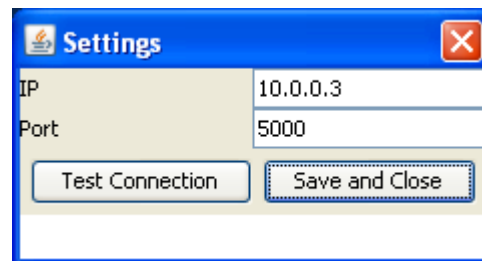


Configuring reconstruction PC IP address

Select the option *Reconstruction PC* from the *Settings* menu.



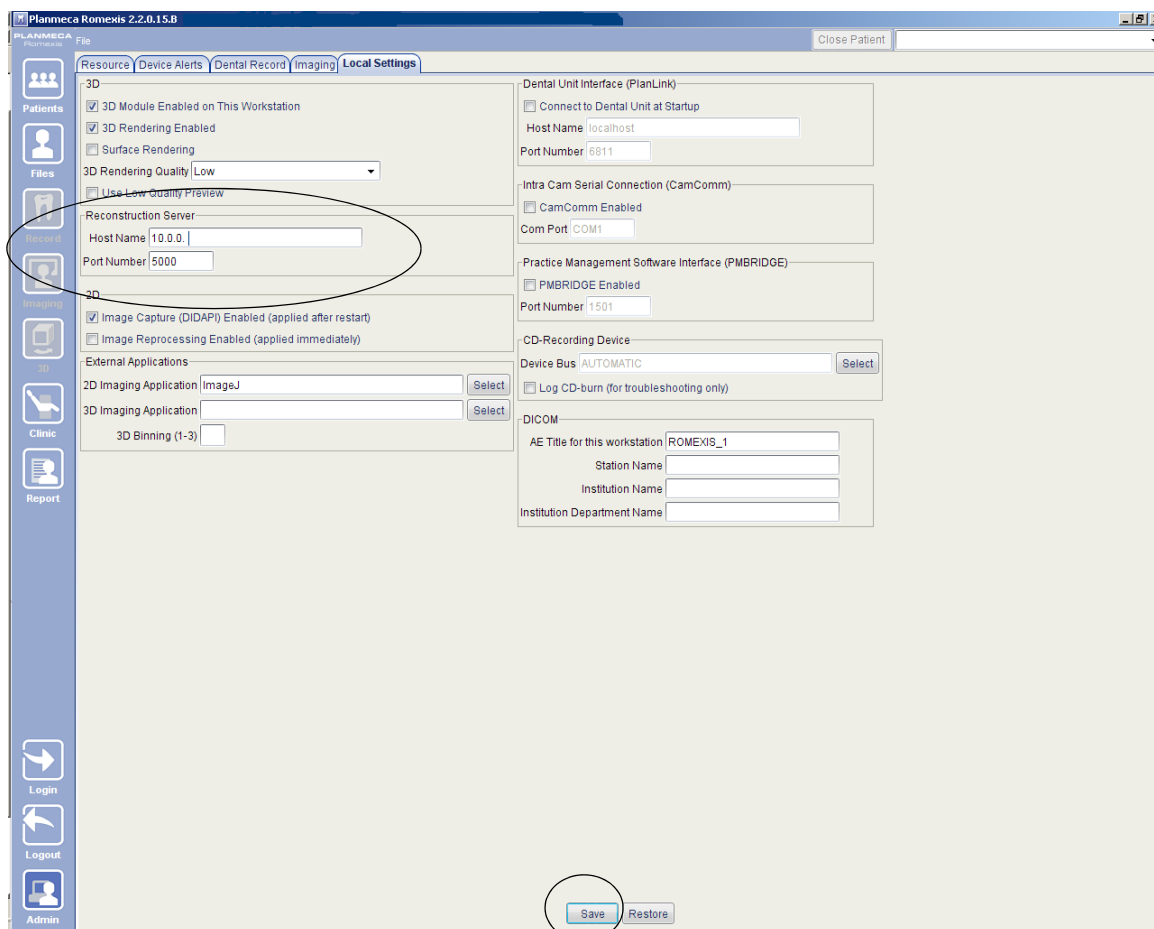
Enter the new IP address in the *Settings* window and save the setting by clicking *Save and Close*. The port must be 5000.



Reboot the reconstruction PC and check communication from the Romexis PC to the reconstruction PC by opening the Command Prompt and executing the command "**ping <reconstruction PC IP address>**".

9.6 Configuring the reconstruction PC IP address in Romexis

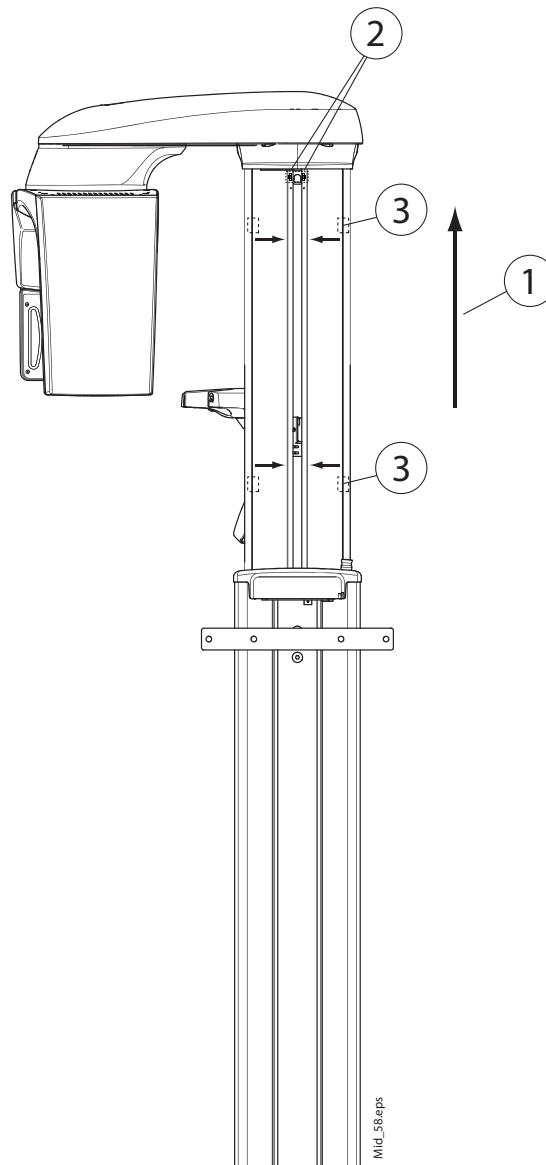
Configure the new reconstruction PC IP address also in the *Reconstruction Server* field in Romexis software (*Admin > Local Settings*).



10 INSTALLING THE CEPHALOSTAT

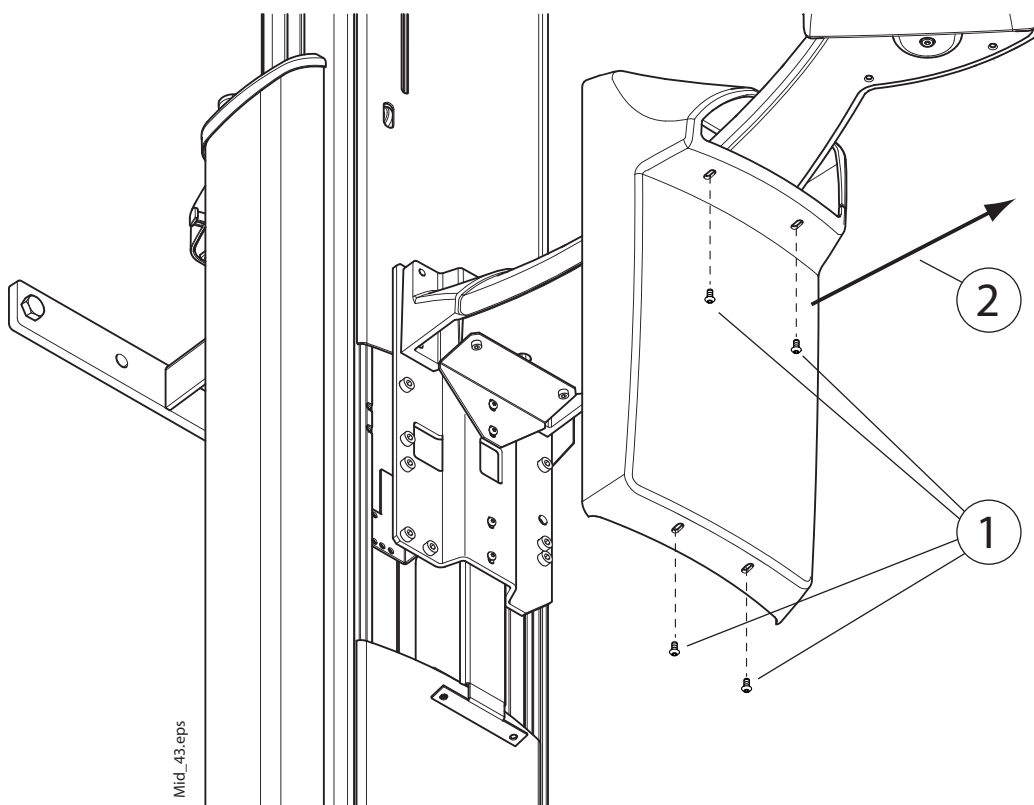
10.1 Attaching the cephalostat to the X-ray

If the two rear cover plates are attached to the unit remove them. Switch the unit on and drive the telescopic column to the uppermost position (1). Switch the unit off. Detach the upper inner corner of the cover plate by carefully pulling it outwards (2). Detach the cover plate by pushing the cover plate inwards (see small arrows on the figure below) (3).

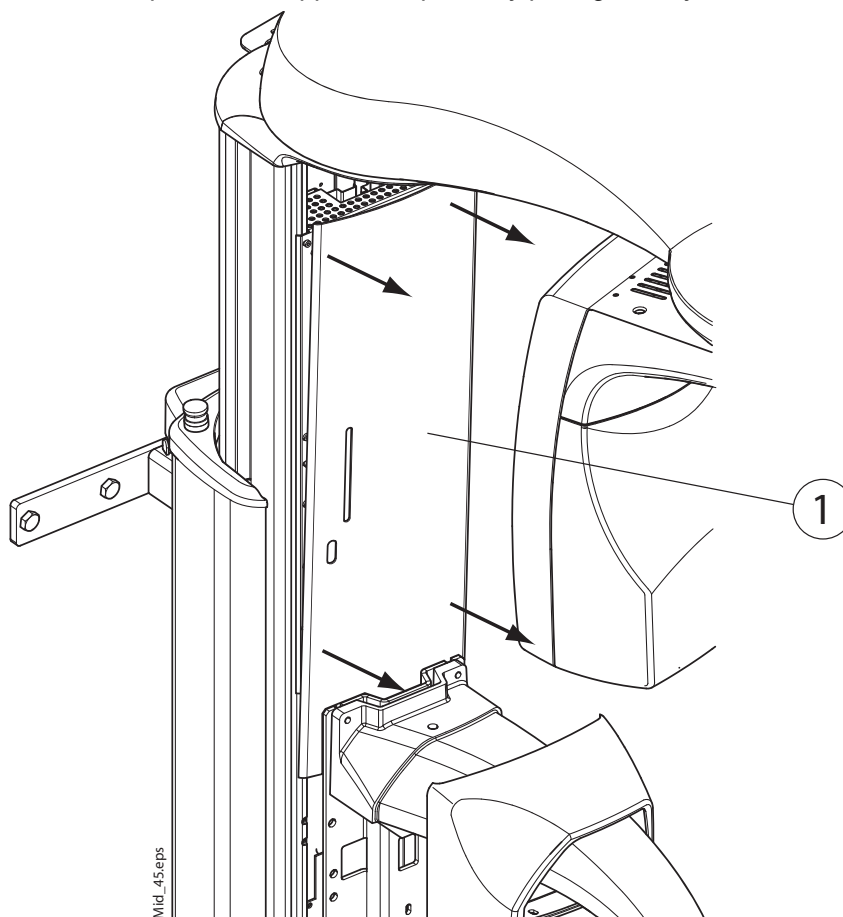


INSTALLING THE CEPHALOSTAT

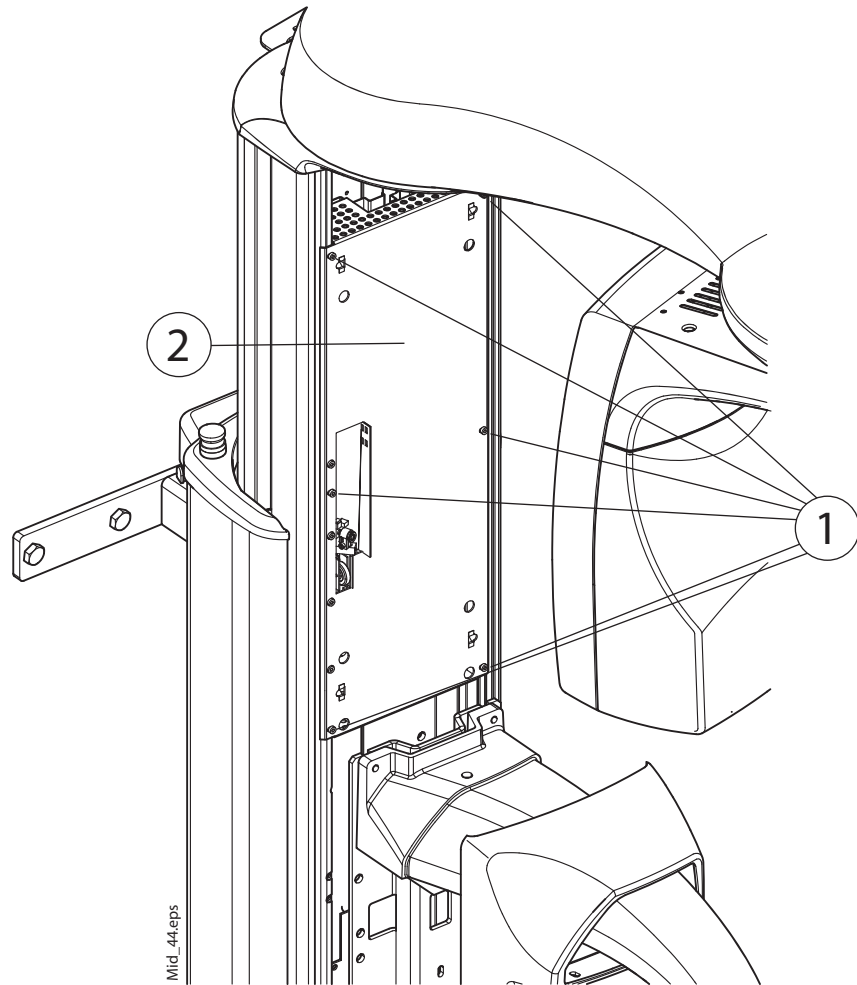
Unscrew four attachment screws of the patient support carriage cover (1) and pull the cover away from its position (2).



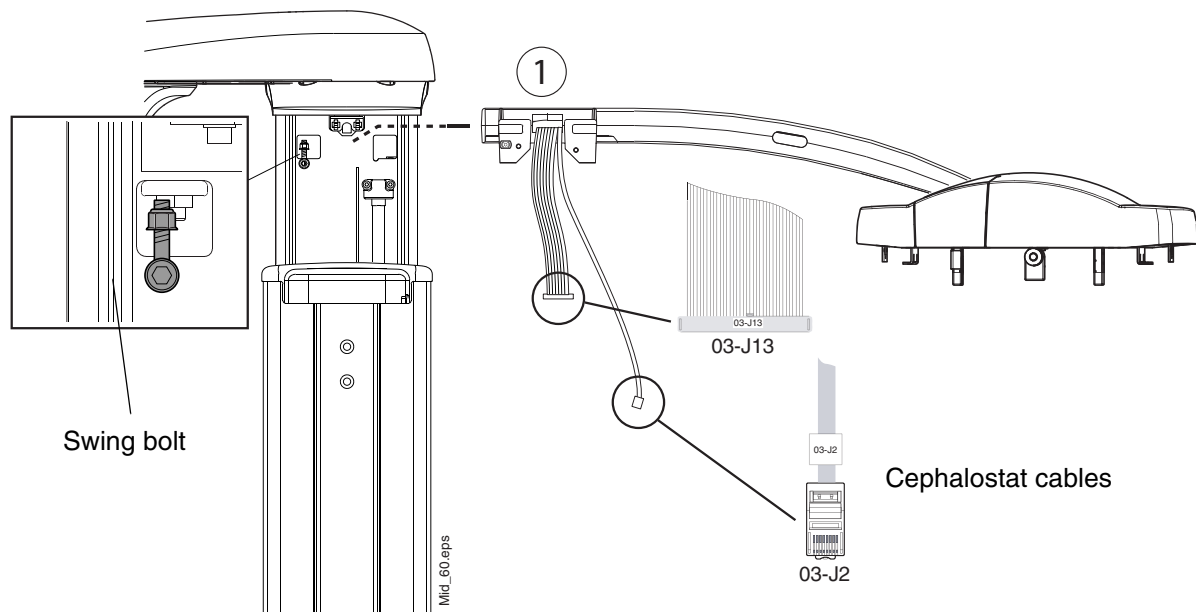
Remove the telescopic column upper front panel by pulling it away from the column (1).



Unscrew the six screws of the EMC cover (1) and remove the cover (2).

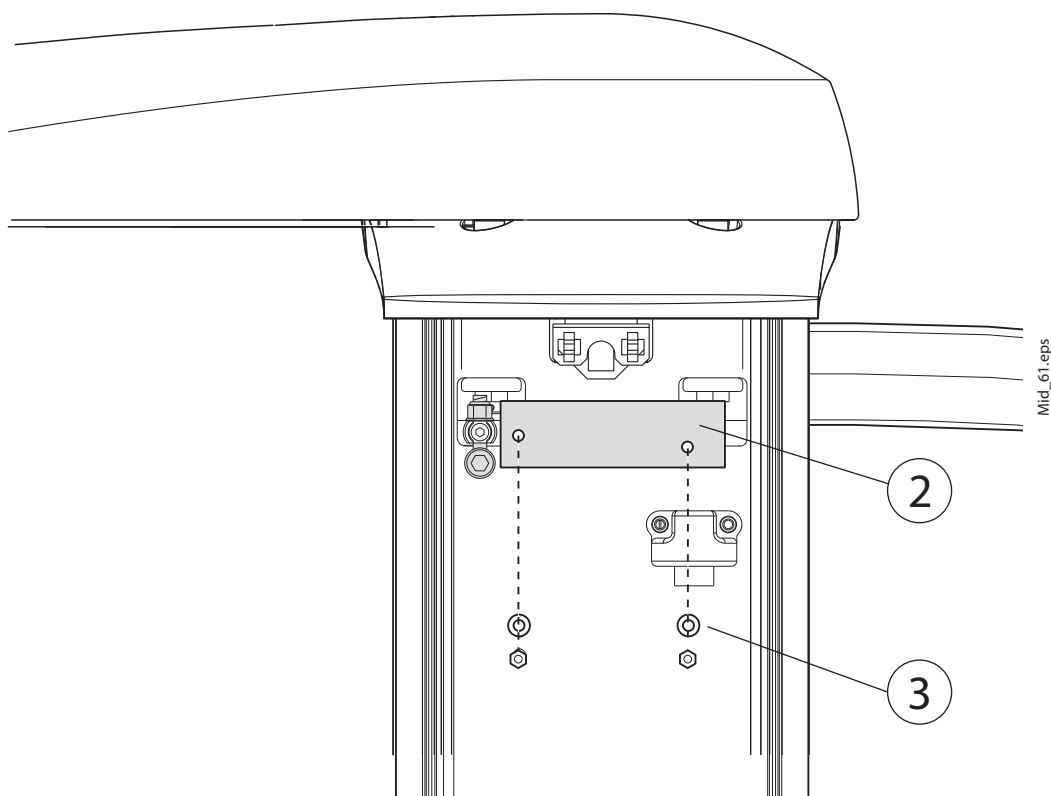


The nut of the swing bolt is adjusted to the correct height at the factory. Do not move the nut. Lift the cephalostat to the front of the telescopic column so that the attachment screws go through the openings on the column (1). Be careful not to damage the cables.

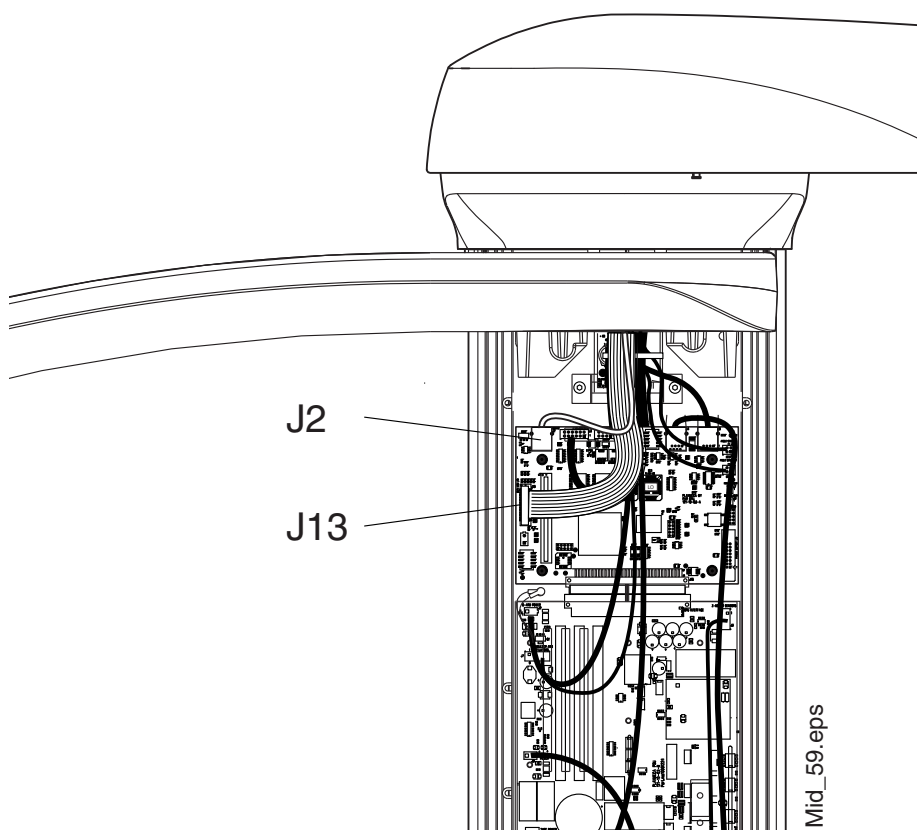


INSTALLING THE CEPHALOSTAT

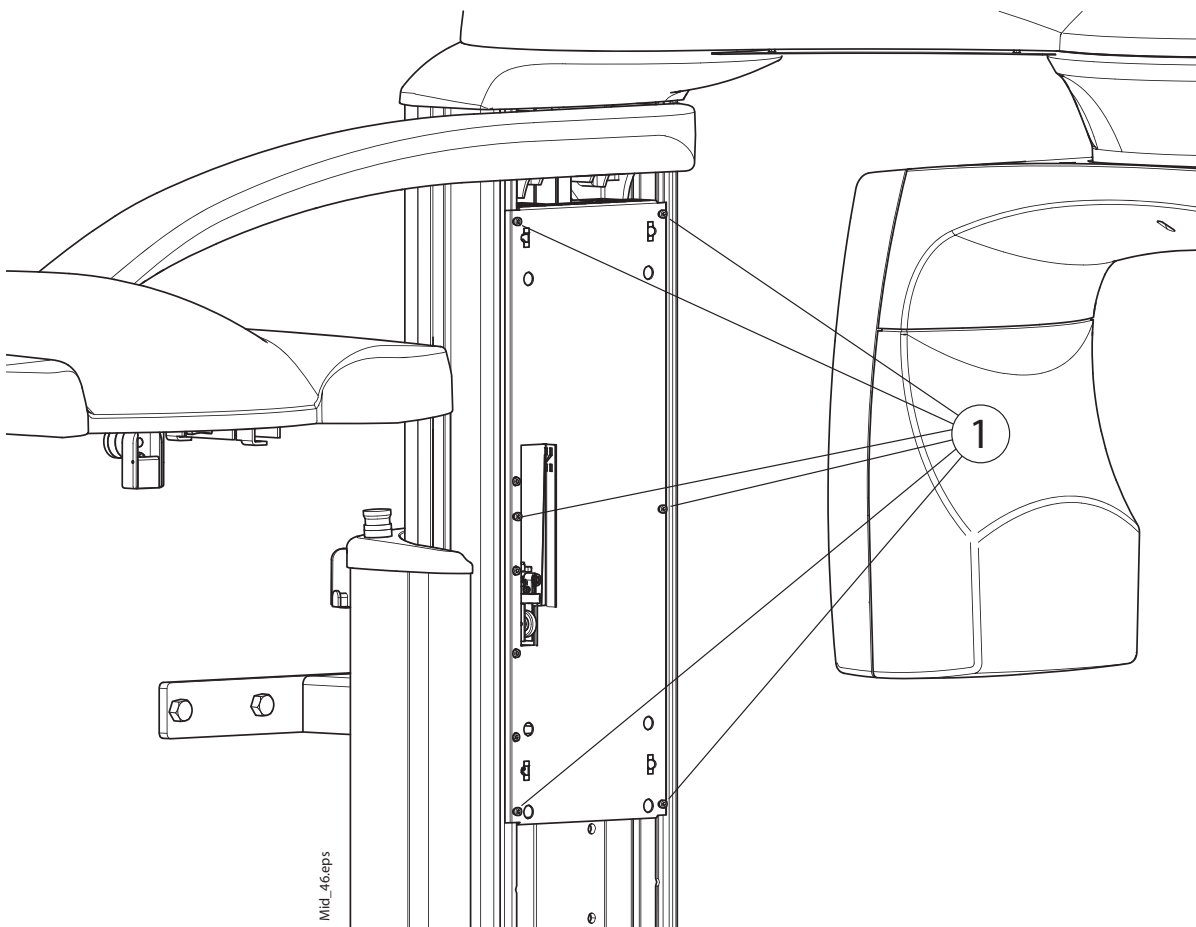
Place the attachment plate to its position (2) and attach it with the two washers and nuts (3). Tighten the attachment nuts firmly.



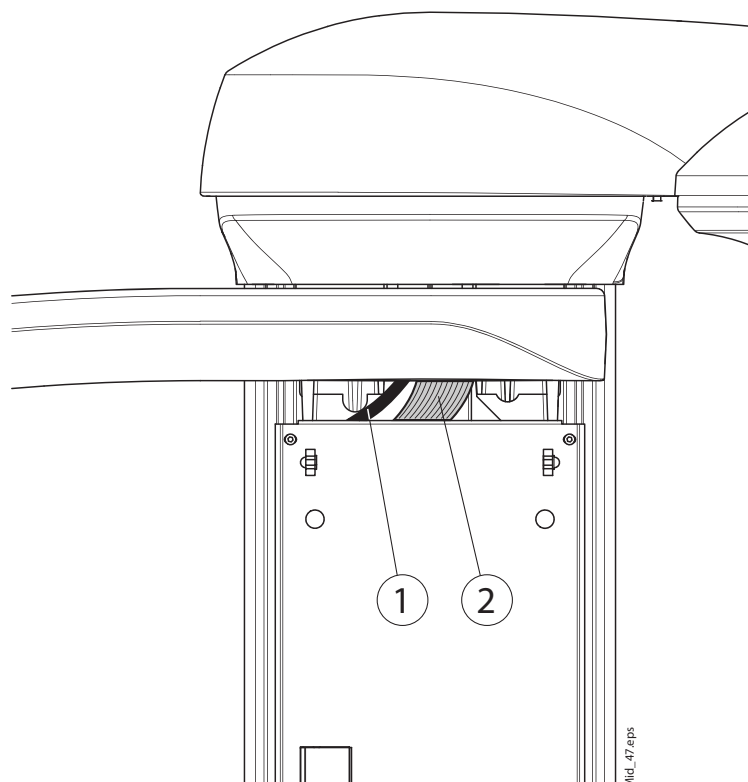
Connect the cephalostat cable to the connector J13 and the cephalostat data cable to the connector J2 on the CPU PCB.



Attach the EMC cover back to its position (1).

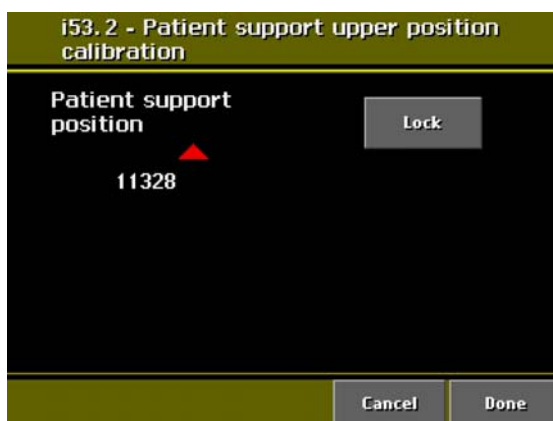


Make sure that the cephalostat cable (1) and cephalostat data cable (2) are not sharply bent or squeezed.

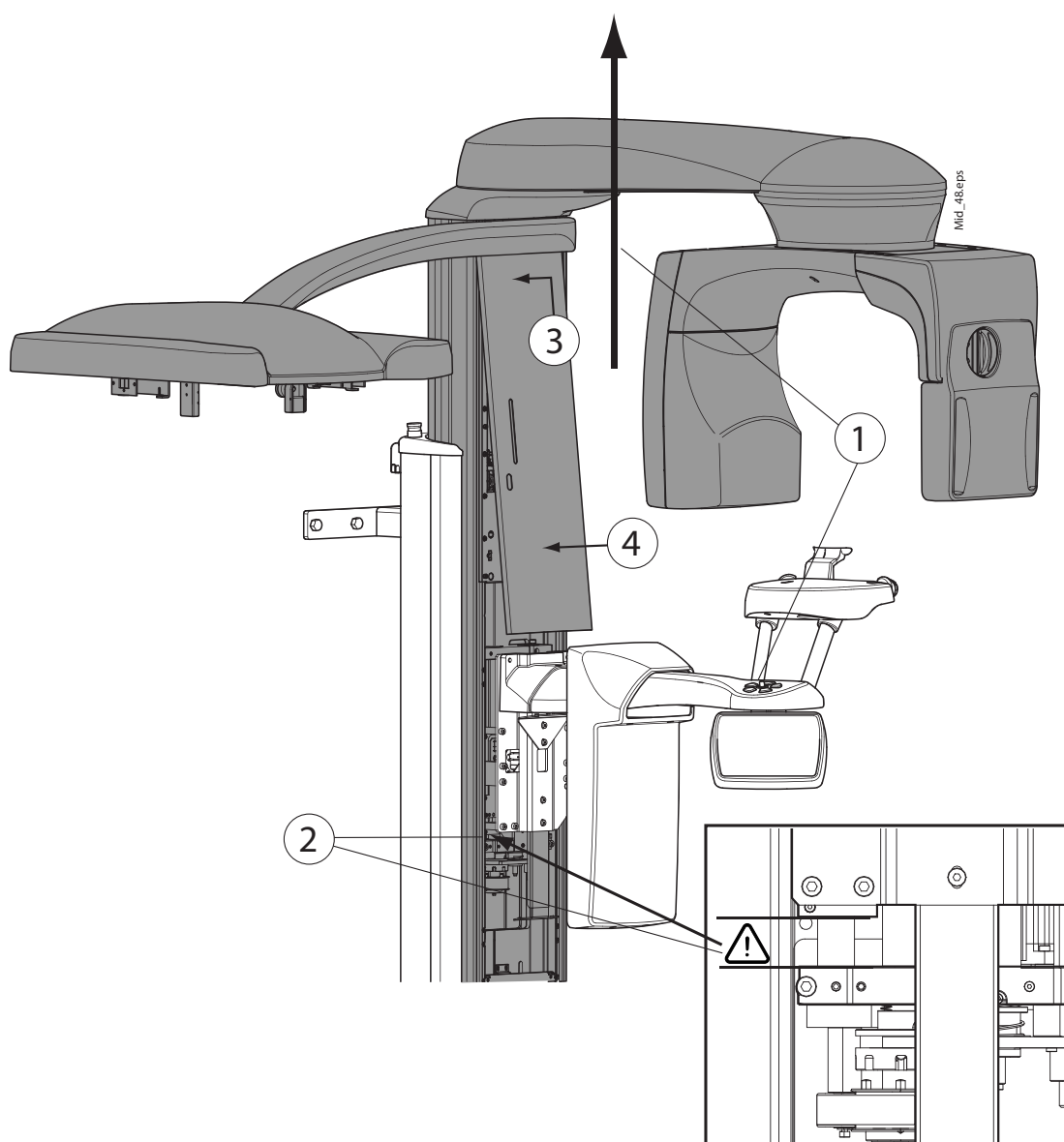


INSTALLING THE CEPHALOSTAT

Select from Technical calibrations the Patient support upper position calibration (i53.2). When text “Lock” is shown on the field, the motor is released and can be driven.



Carefully drive the telescopic column upwards (1) so that you can place the upper front panel to its position. **DO NOT DRIVE THE ARM TO THE MECHANICAL LIMIT!** (2) Attach the upper front panel to its position (3 and 4).



NOTE IMPORTANT: After attaching the cover exit the Patient support upper position calibration mode by touching CANCEL.

10.2 Attaching the sensor head adapter to the cephalostat

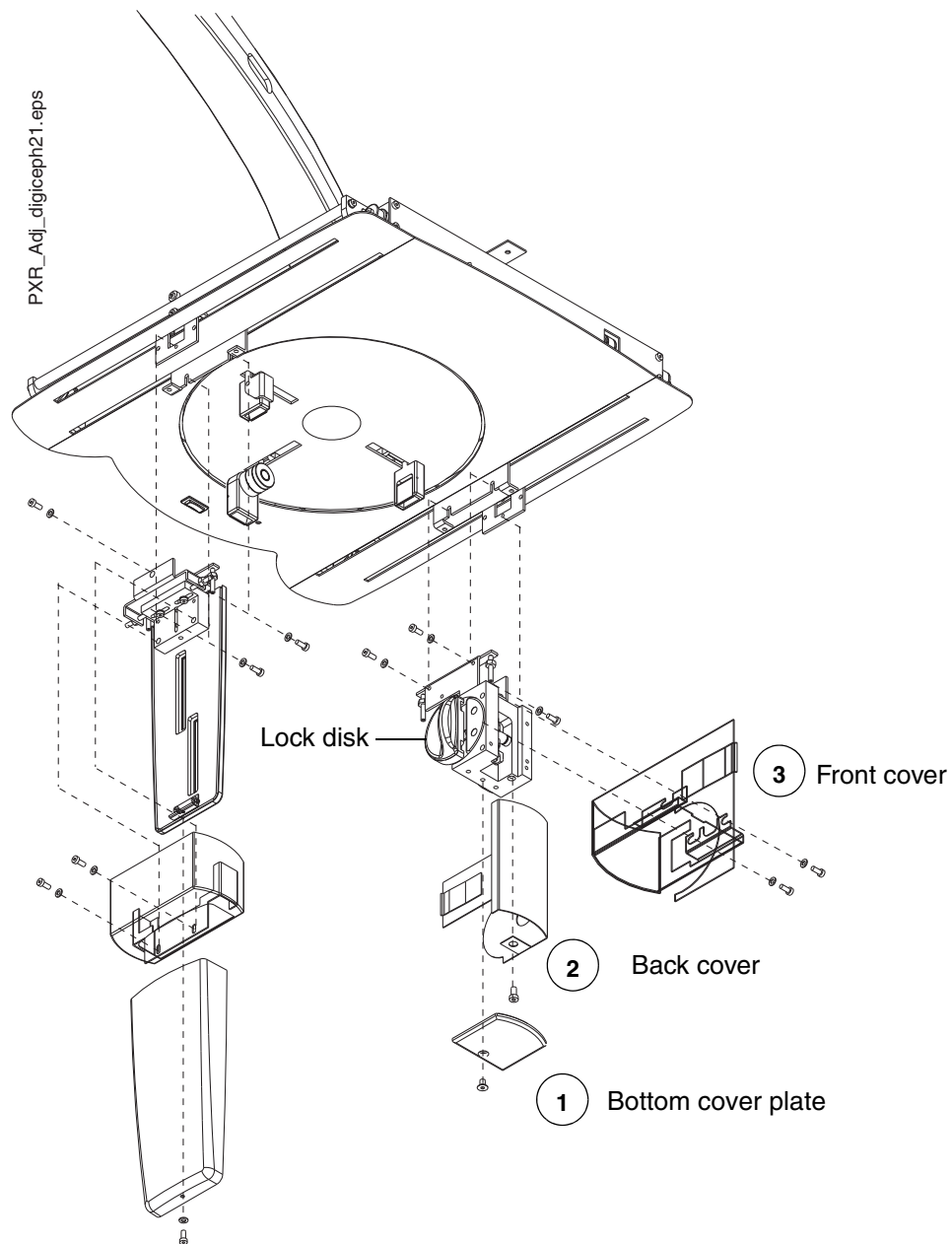
Cephalostat with movable sensor head - attaching the sensor head adapter

NOTE If the cephalostat is equipped with fixed sensor head, attach the sensor head adapter to the cephalostat according to the instructions given in section “Cephalostat with fixed sensor head - attaching the sensor head adapter” on page 53.

Before attaching the sensor head adapter remove its covers: Unscrew the bottom cover plate attachment screw with the 4mm Allen key and remove the cover plate (1).

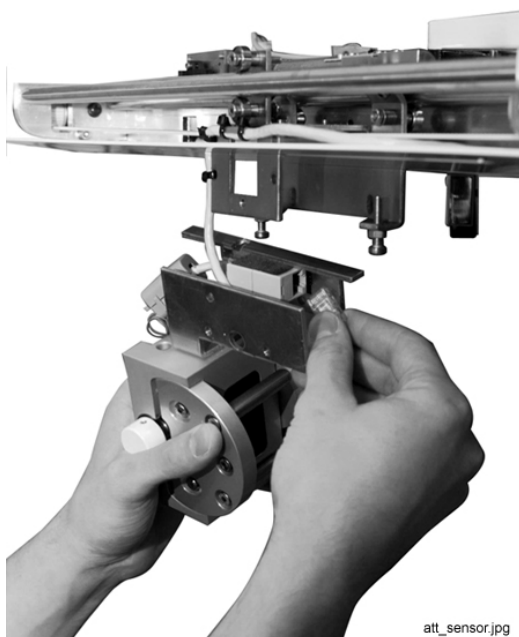
Unscrew the attachment screw of the quick connector mechanism back cover with the 4mm Allen key and slide the cover away from its position (2).

Turn the lock disc approx. 90° counter clockwise. Loosen the attachment screws of the front cover with the 3mm Allen key and slide the cover away from its position (3).

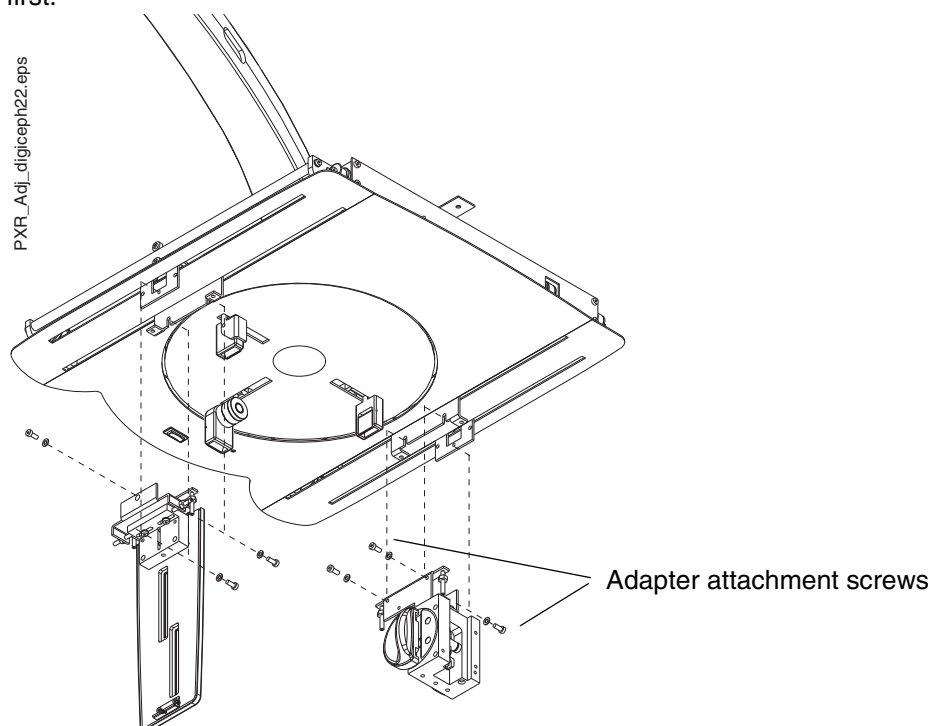


INSTALLING THE CEPHALOSTAT

Attach the cephalostat data cable to the connector located on the sensor head adapter. Note that the connector is attached to the adapter with velcro tape and can be temporarily detached, if needed.



Attach the sensor head adapter tentatively to the cephalostat with three attachment screws with 3mm Allen key. Do not tighten the screws yet, the position of the adapter must be checked first.



Before tightening the adapter attachment screws, perform the adjustment of the sensor head adapter according to the instructions given in ProMax X-ray unit's Technical manual,.

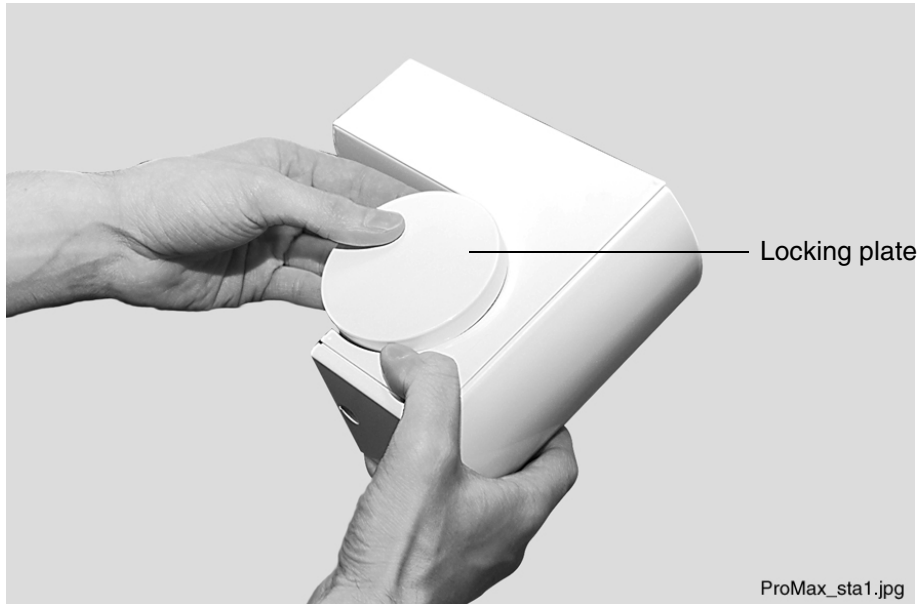
NOTE The cephalostat beam alignment must be checked before attaching the second primary collimator to the cephalostat. Check the beam alignment according to the instructions given in ProMax X-ray technical manual.

Cephalostat with fixed sensor head - attaching the sensor head adapter

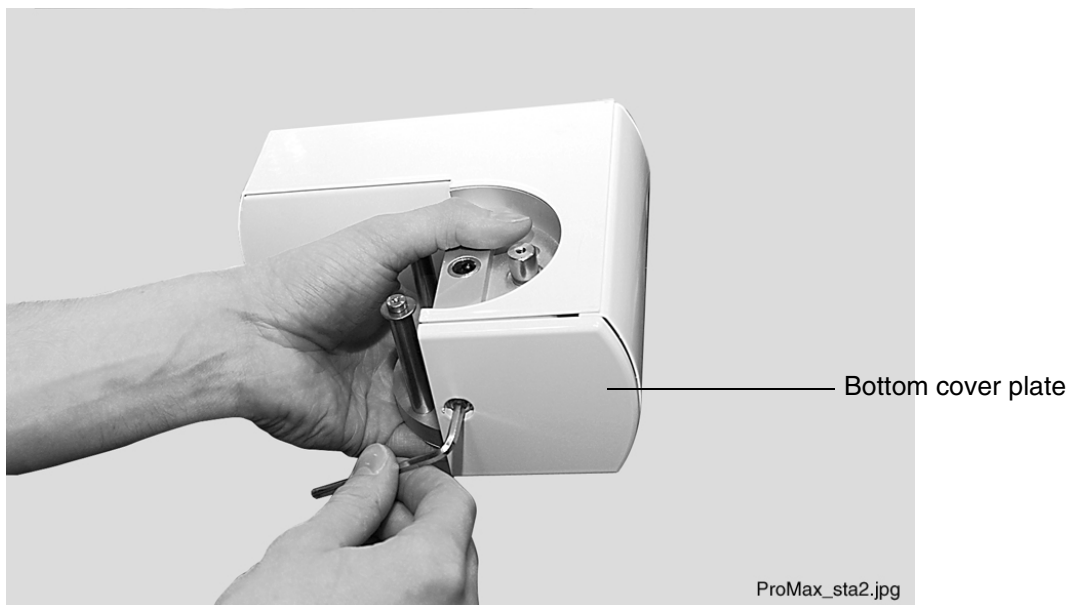
NOTE If the cephalostat is equipped with movable sensor head, attach the sensor head adapter to the cephalostat according to the instructions given in section “Cephalostat with movable sensor head - attaching the sensor head adapter” on page 51.

Remove first the sensor head adapter covers:

Remove the locking plate.

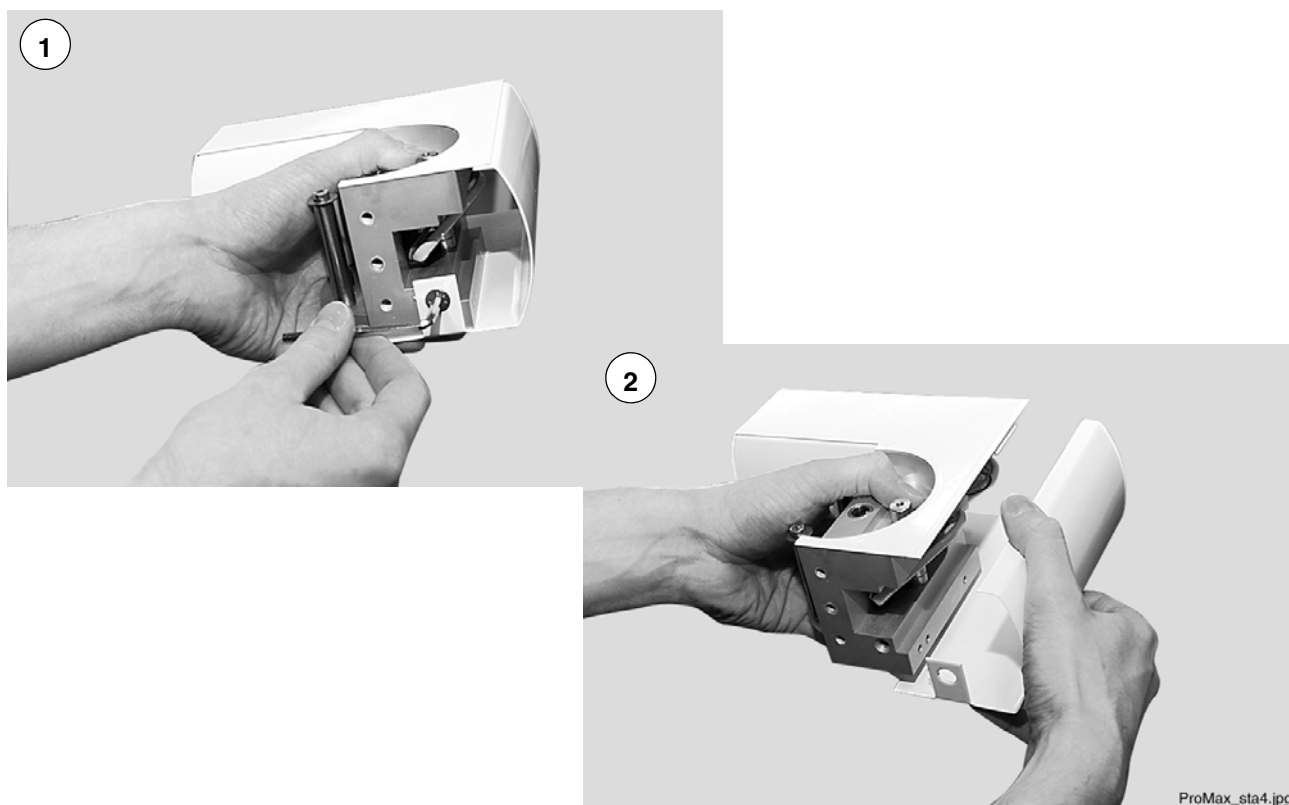


Unscrew the bottom cover plate attachment screw with the 4mm Allen key and remove the cover plate.

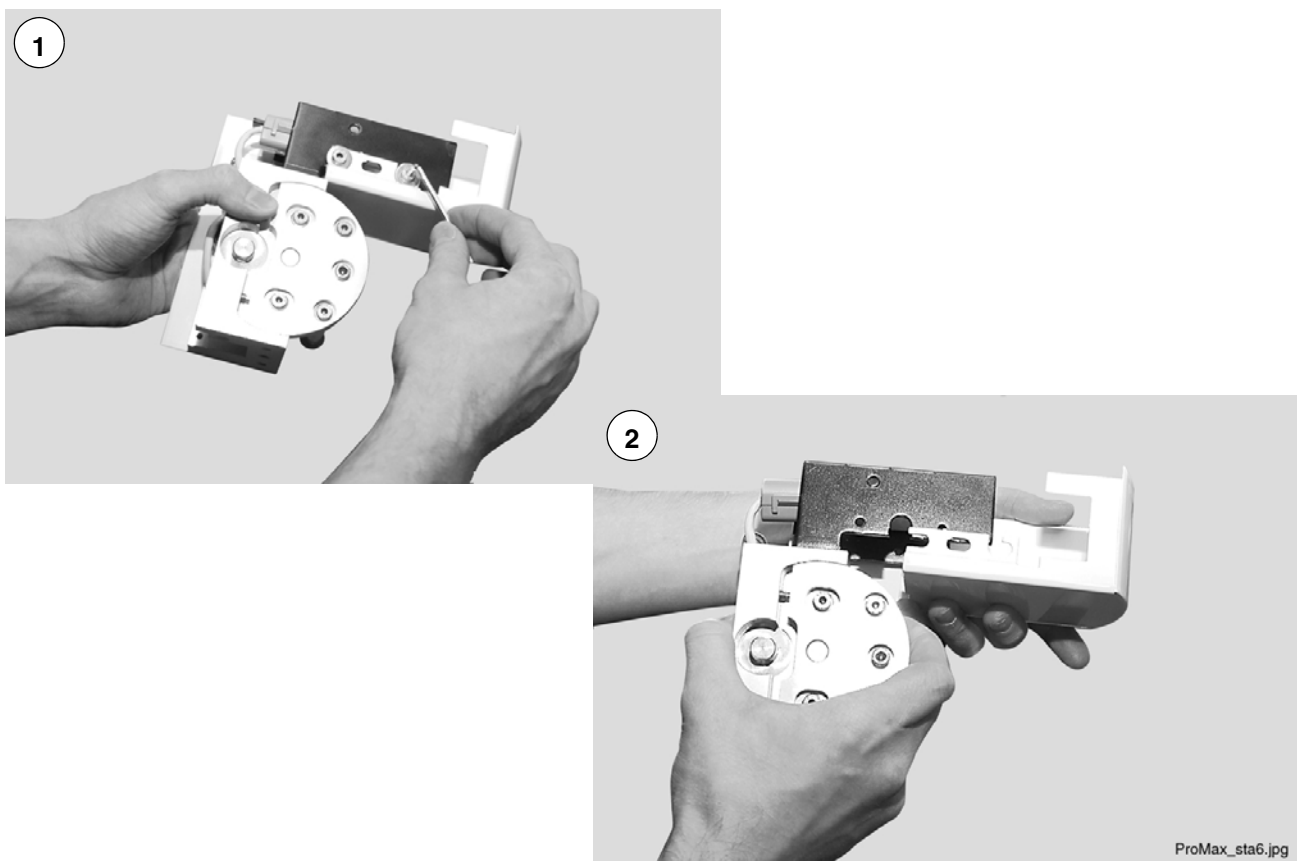


INSTALLING THE CEPHALOSTAT

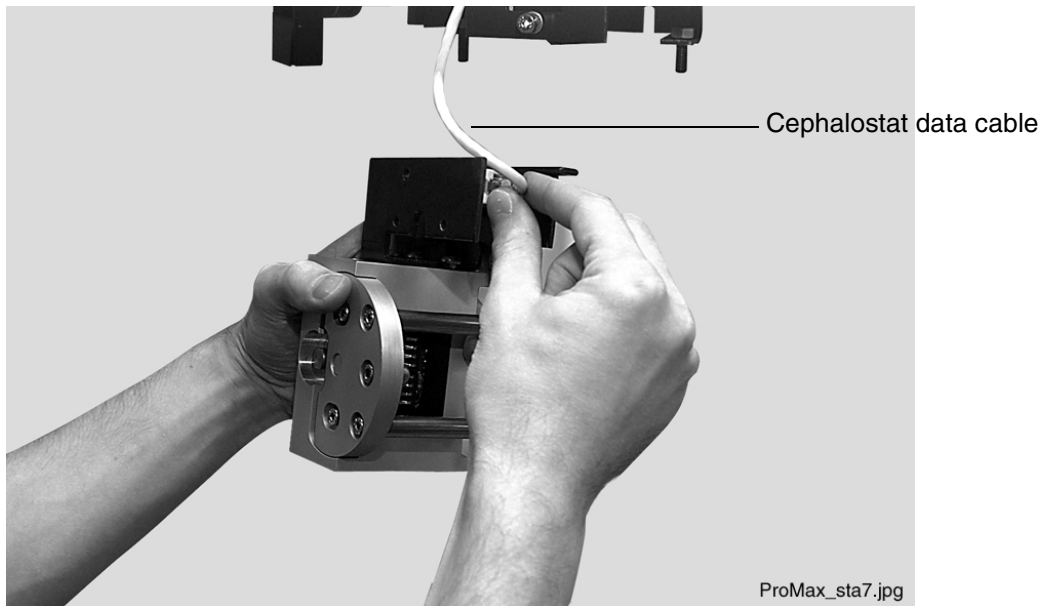
Unscrew the attachment screw of the back cover with the 4mm Allen key (1) and slide the cover from its position (2).



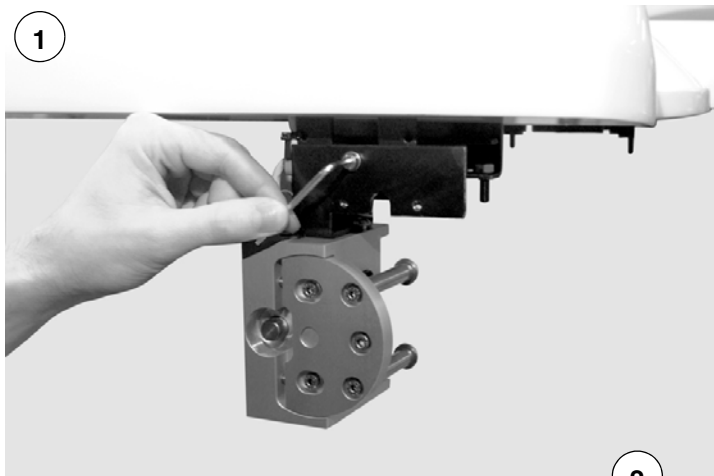
Unscrew the two front cover attachment screws with the 3mm Allen key (1) and remove the cover (2).



Attach the cephalostat data cable to the connector located on the sensor head adapter.



Unscrew one adapter attachment screw from the attachment plate on the cephalostat (1) and two attachment screws from the sensor head adapter with the 3mm Allen key (2). Attach the sensor head adapter to the cephalostat with these three attachment screws.



Before tightening the adapter attachment screws, perform the adjustment of the sensor head adapter according to the instructions given in ProMax X-ray unit's Technical manual.

NOTE **The cephalostat beam alignment must be checked before attaching the second primary collimator to the cephalostat. Check the beam alignment according to the instructions given in ProMax X-ray technical manual.**

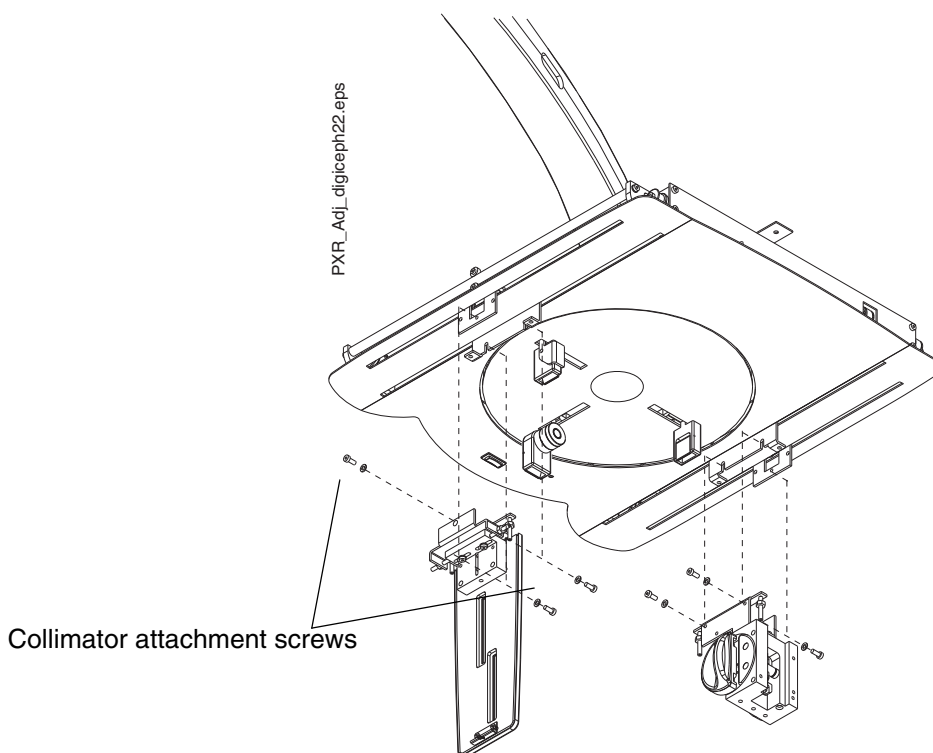
The sensor head is attached to the adapter after the cephalostat alignment has been checked.

10.3 Attaching the second primary collimator

NOTE The cephalostat beam alignment must be checked before attaching the second primary collimator to the cephalostat. Before the second primary collimator is attached, check the beam alignment according to the instructions given in ProMax X-ray technical manual.

Before attaching the second primary collimator remove its covers: Unscrew the collimator cover attachment screw using the 2mm Allen key and slide the collimator cover from its position. Unscrew the two collimator cover box attachment screws using the 3mm Allen key and slide the collimator cover box from its position (see figure on next page).

Attach the collimator plate tentatively to the cephalostat with three attachment screws by using 3mm Allen key. Do not tighten the screws yet, the position of the collimator plate must be checked first.



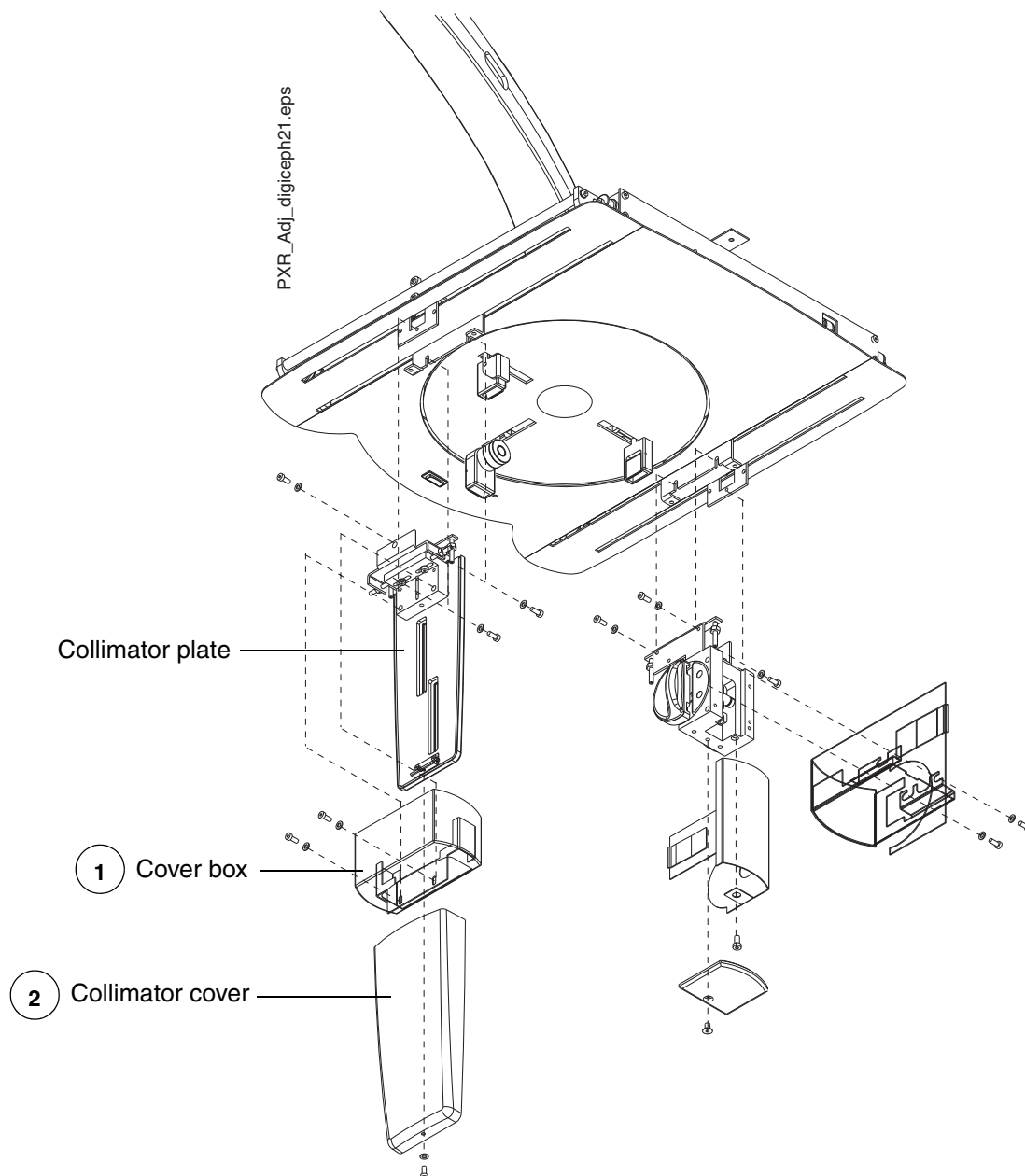
Before tightening the collimator attachment screws, check and adjust the position of the second primary collimator according to the instructions given in ProMax X-ray unit's Technical manual.

INSTALLING THE CEPHALOSTAT

Tighten the attachment screws and attach the second primary collimator covers as follows.

Slide the collimator cover box to its position and attach it with the two attachment screws by using the 4mm Allen key (1).

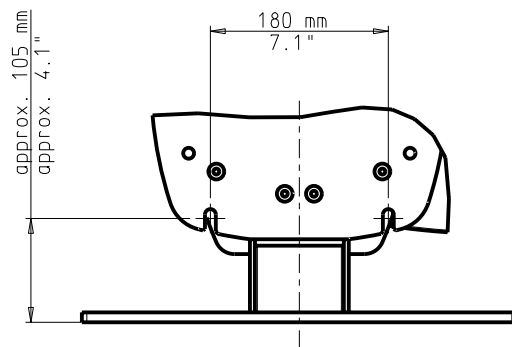
Slide the collimator cover to its position and attach it with the attachment screw by using the 2mm Allen key (2).



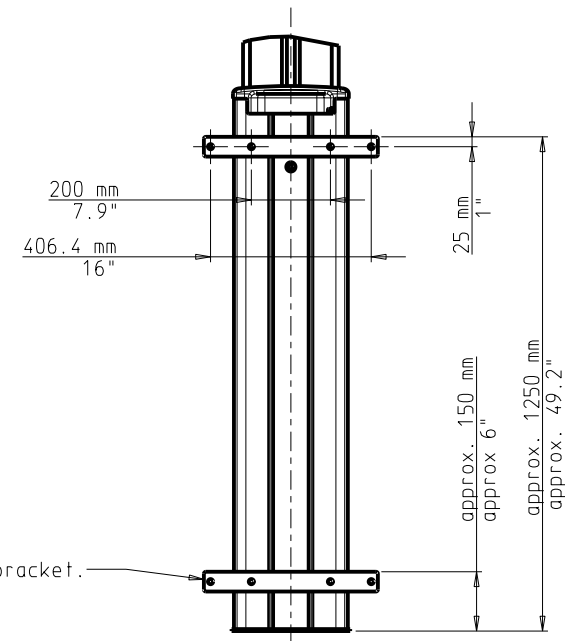
11 CHECKING THE ALIGNMENTS

Perform the adjustments and calibrations according to the instructions given in X-ray unit's Technical Manual..

12 DIAGRAMS

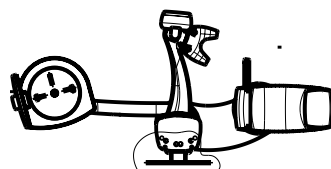


DET. B

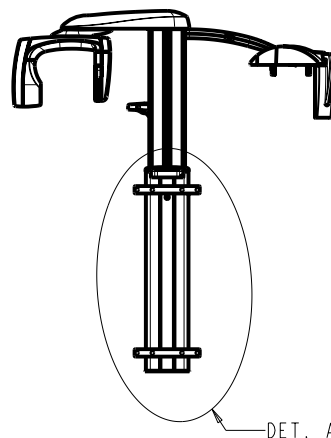


DET. A

For detailed information about installing the unit,
refer to the Planmeca ProMax installation manual.





DET. B



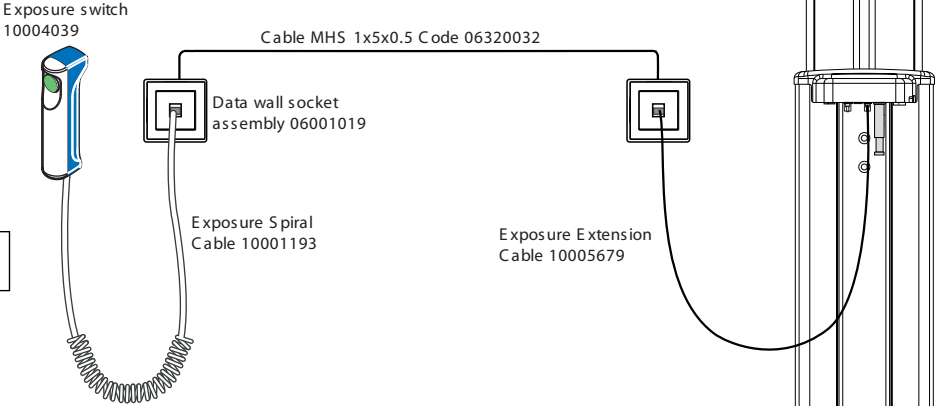
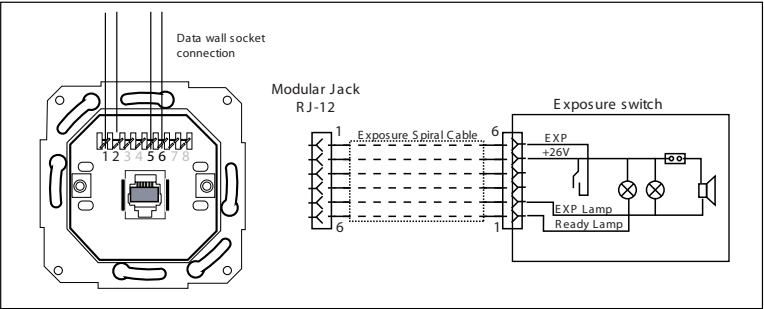
DET. A

Muutos Change	ECO numero ECO number	Muutuskuvauus Change description	Päiväys Date	Muuttaja Changed By

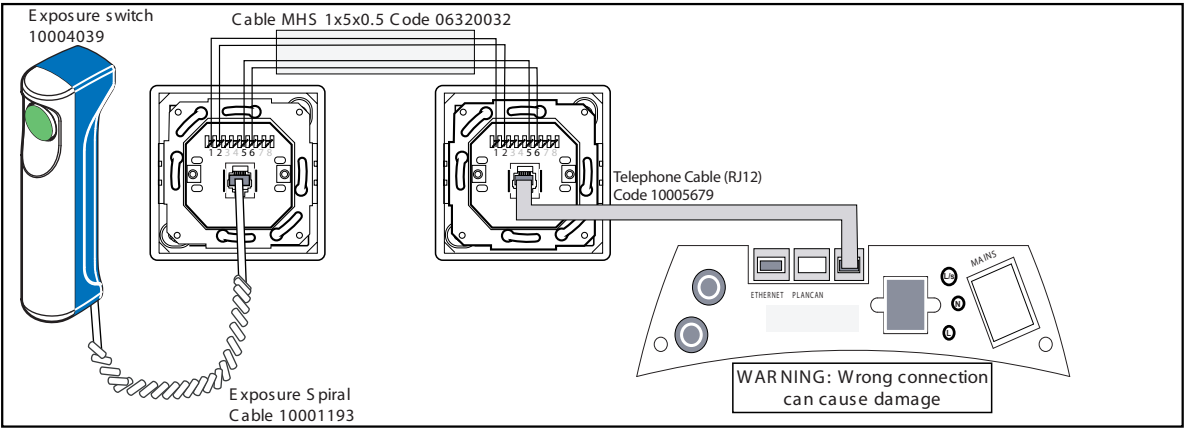
Arvioitu määrä Estimated pcs.		Nimitys ProMax (kiinnitysmitoitus) Name ProMax (attachment dimensions)		Aine Material					
Yleistoleranssi ja luokka General tolerance									
Pintakäs.				Väri Colour					
Surf.finish				Edustava pinta Decorative surf. : - - - - -					
 Asentajankatu 6 00880 Helsinki, Finland tel. +358 9 759 05 500 telex 122430 plan fi telefax +358 9 759 05 566 www.planmeca.com		Piirustusta vastaavan mallin nimi Model name corresponding to drawing		KIINNITYSMITOITUS					
		Suunn. Designer Rantakokko		Model rev.	A	Model vers.	1+	Päiväys Date	24.10.03
		Hyv. Appr. 01267		Tila Status		Koodi Code			
				Suhde Scale		Piir.nro	Drawing no.		Versio Version
						3 - 608 - 42138 - A		1	

INITIAL= julkaistun, PRELIMINARY= alustava, RELEASED= hyväksytty

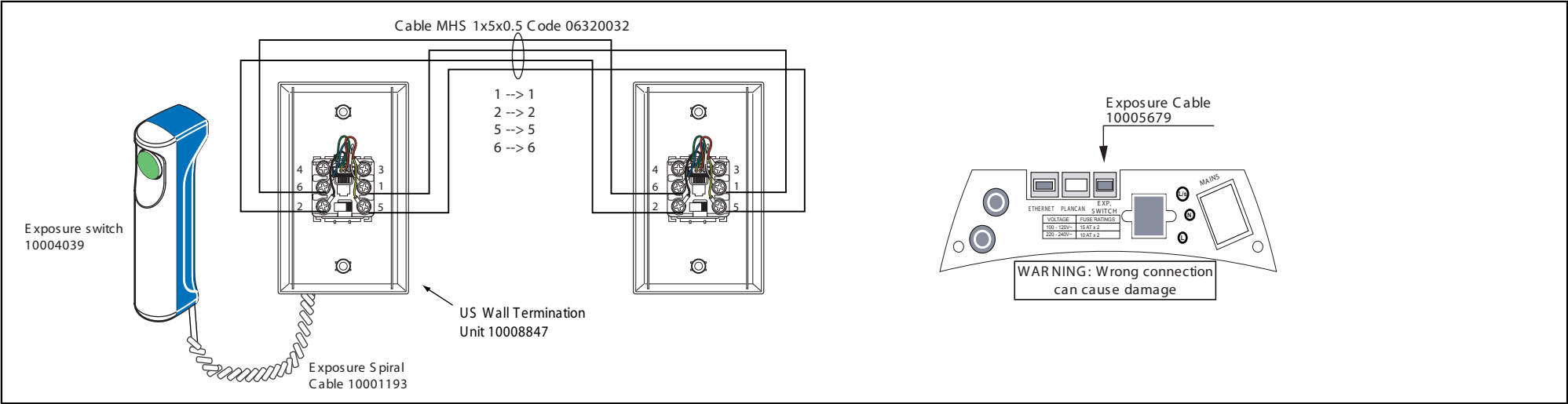
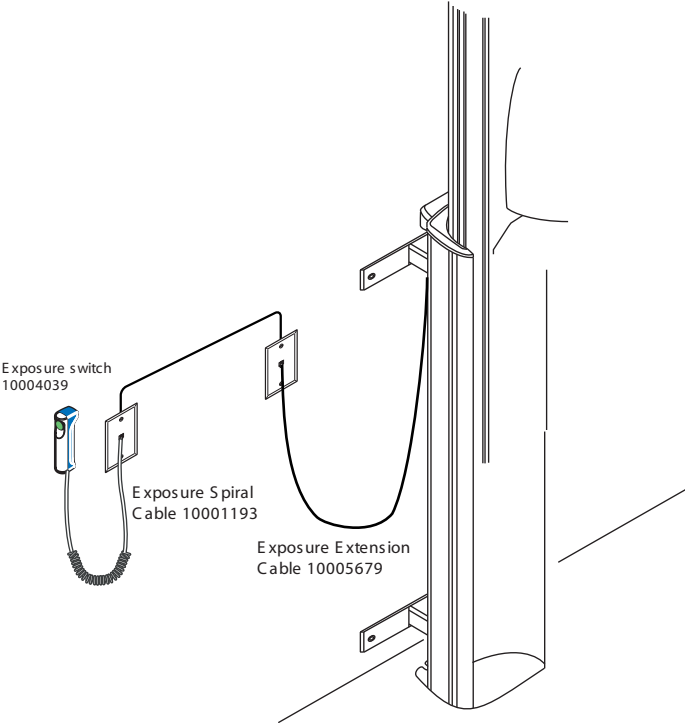
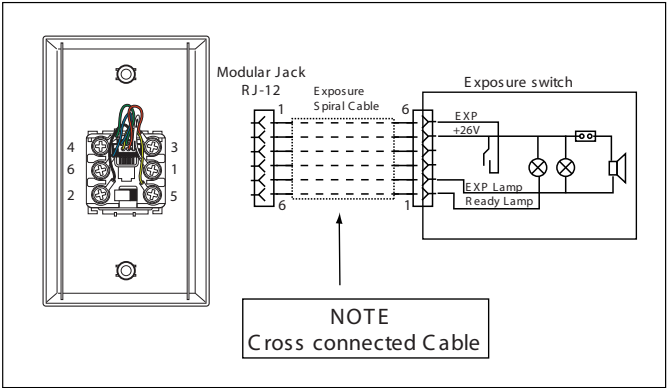
ProMax
Exposure Switch /
Remote connection EU
24.09.2009 LY



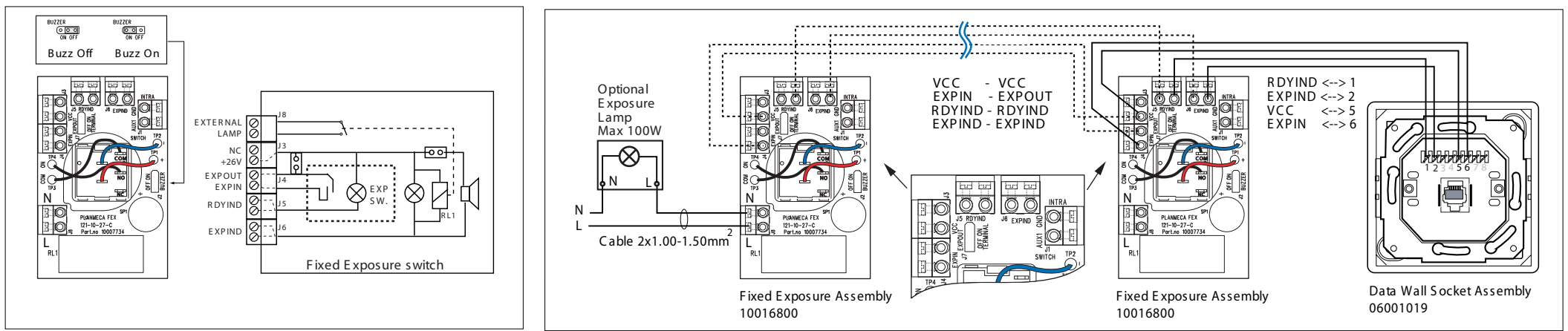
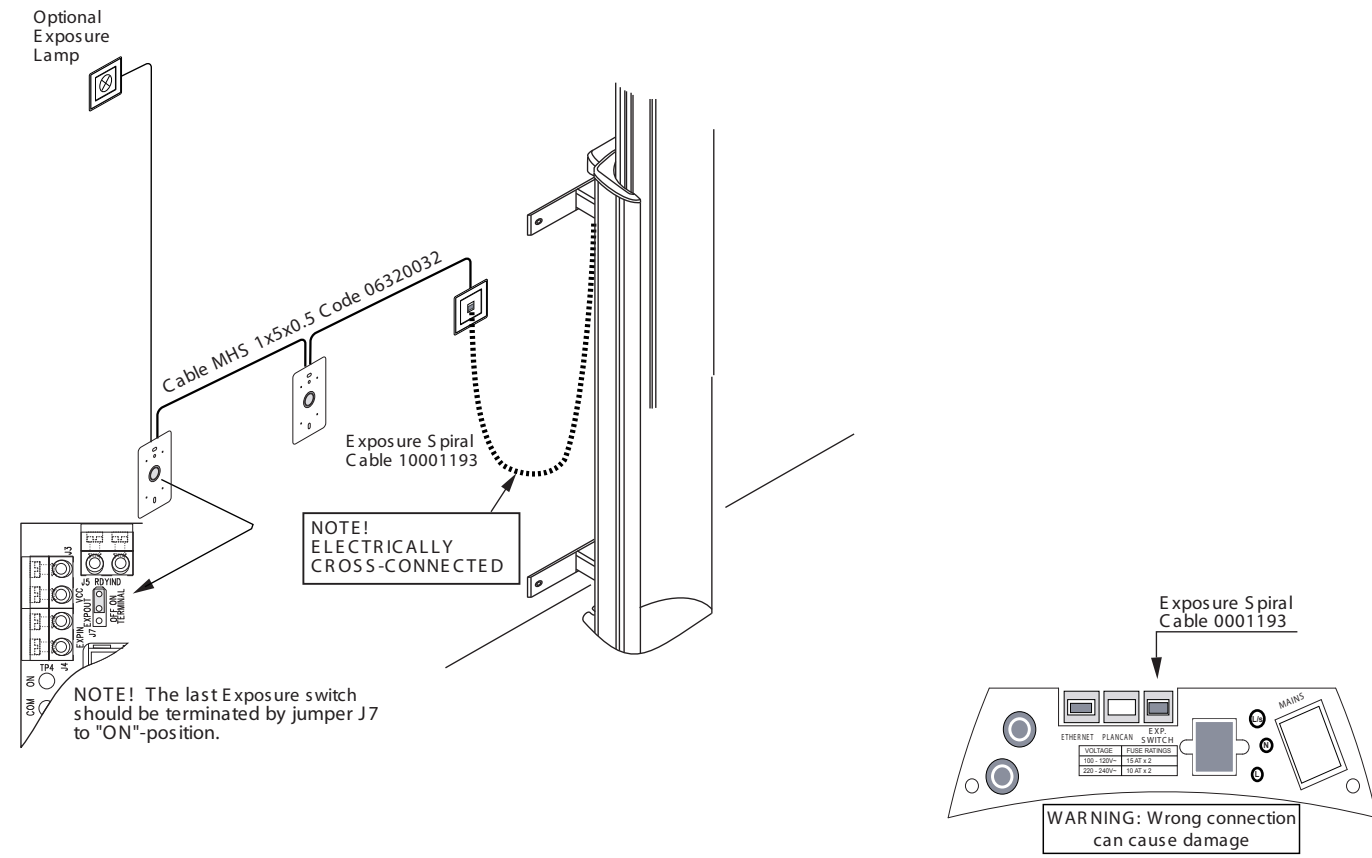
NOTE
Cross connected Cable



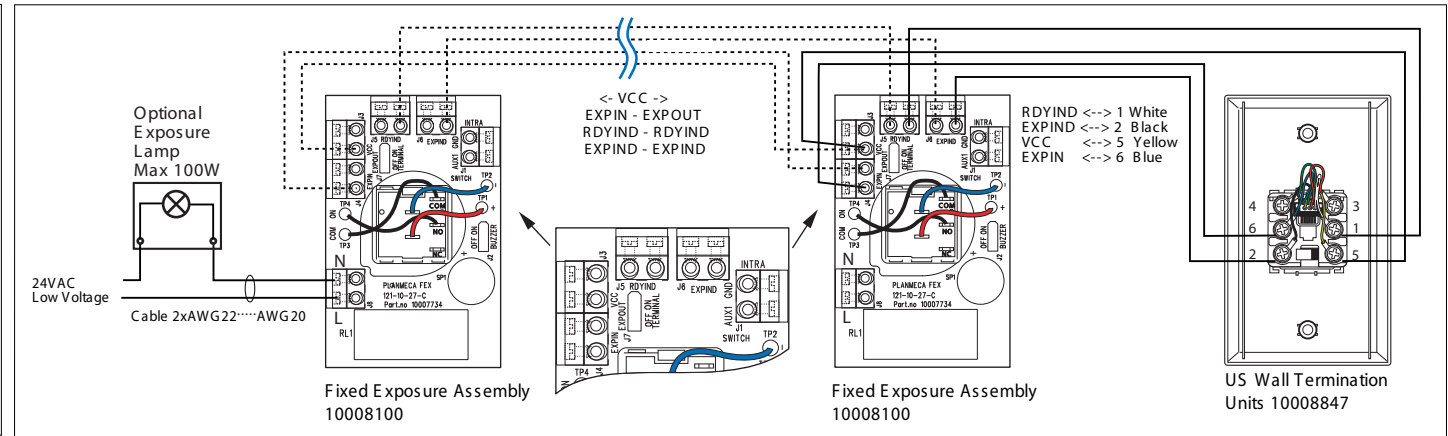
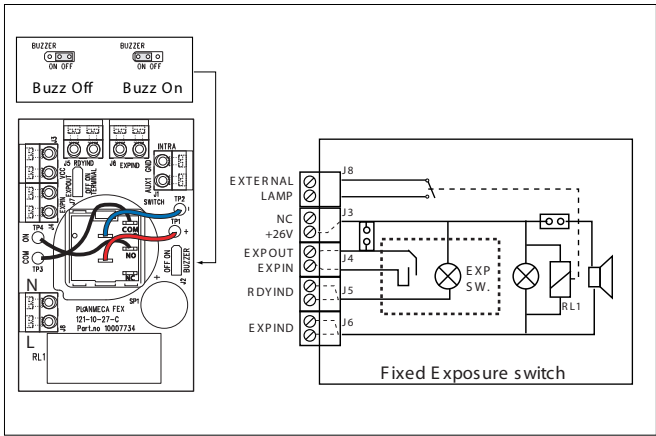
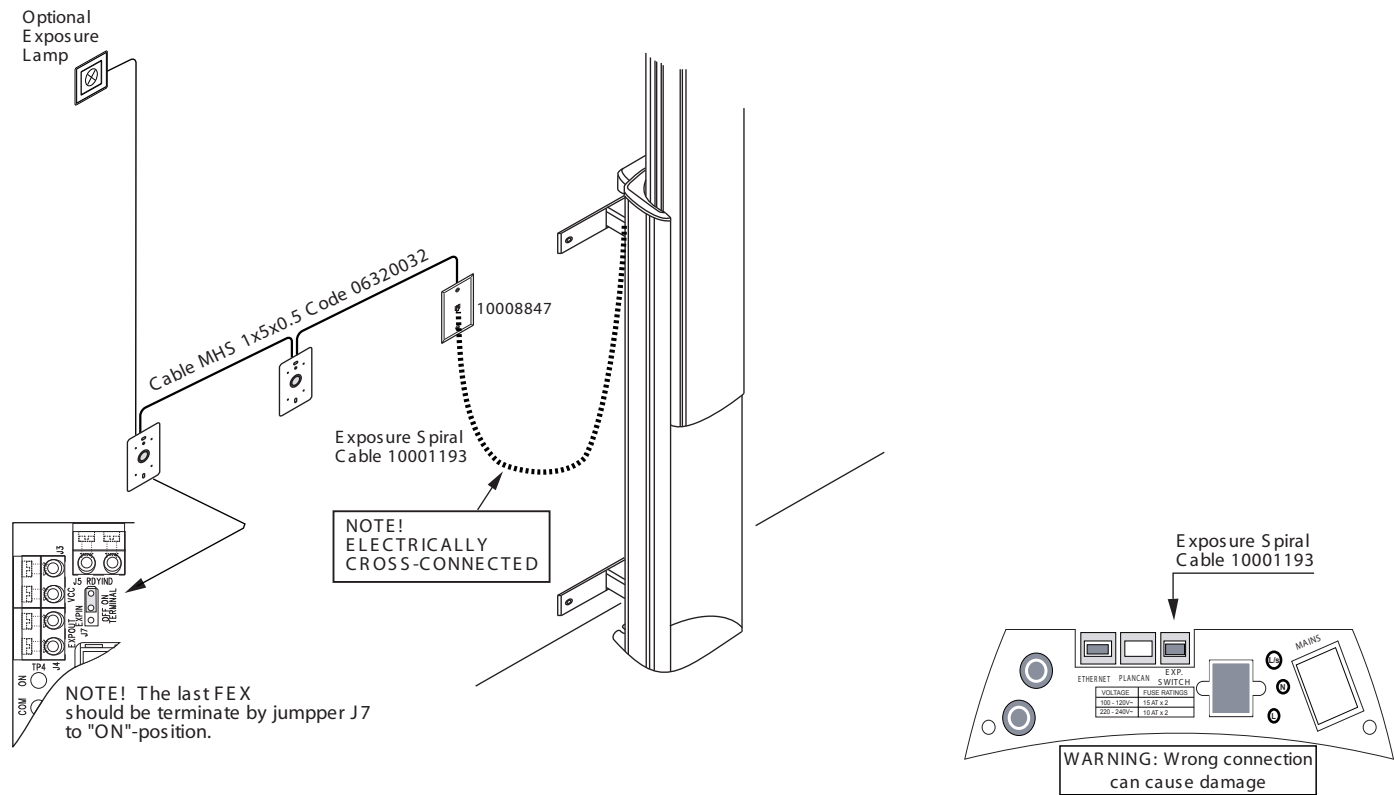
ProMax
Exposure Switch /
Remote connection US
24.09.2009 LY



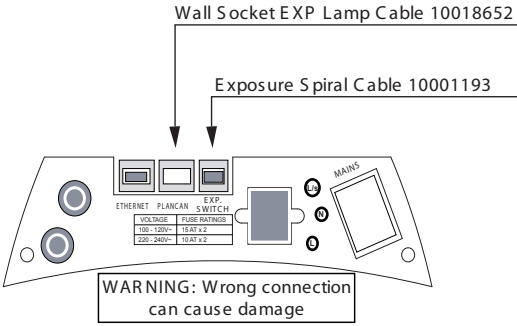
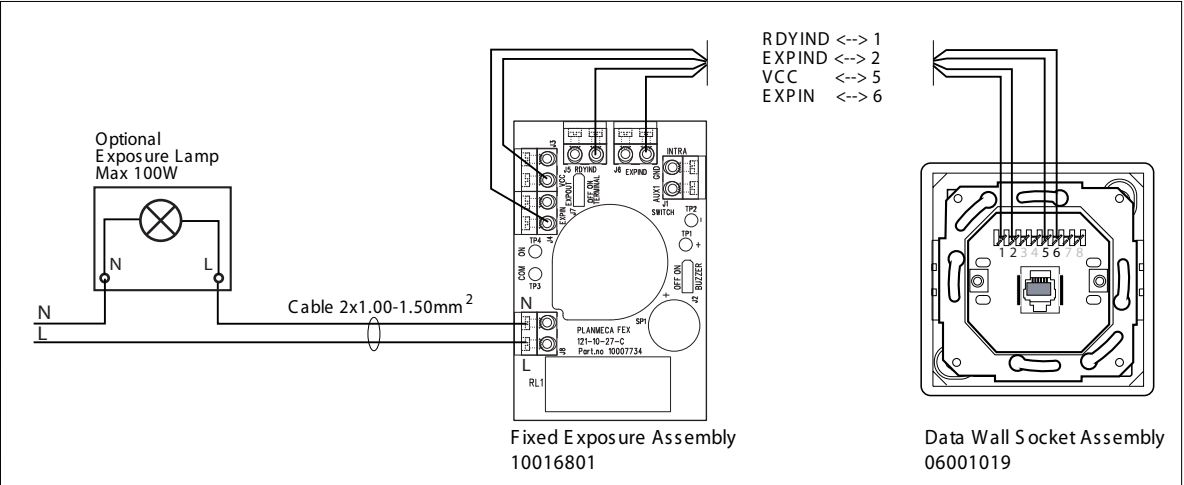
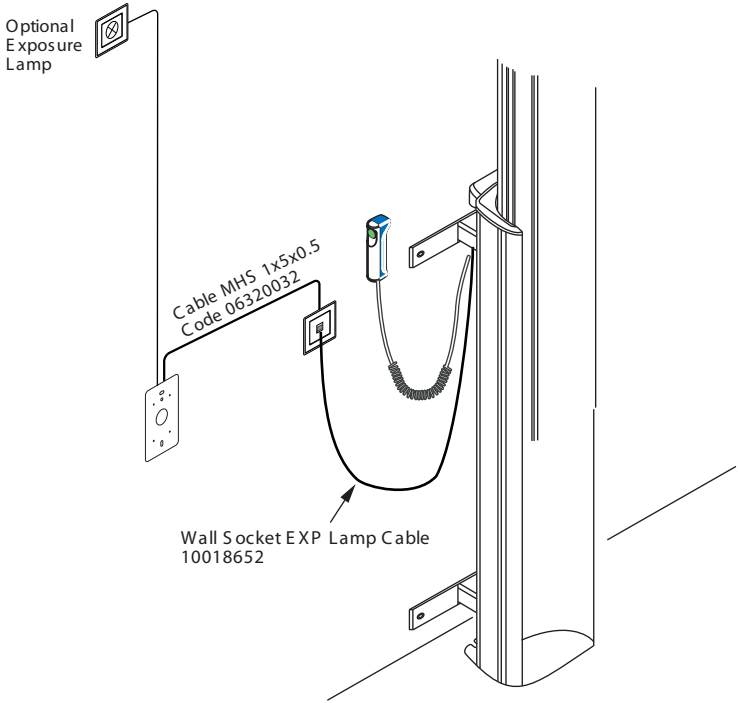
ProMax
Double Exposure Switch / Lamp
Remote connection EU
24.09.2009 LY



ProMax
Double Exposure Switch / Lamp
Remote connection US
24.09.2009 LY

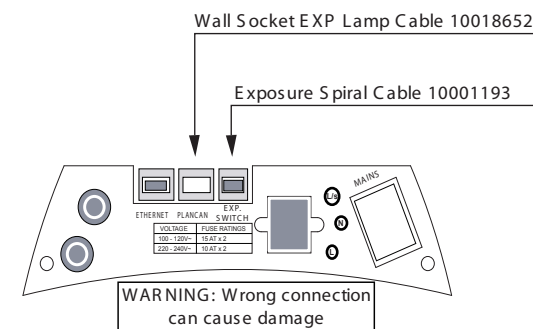
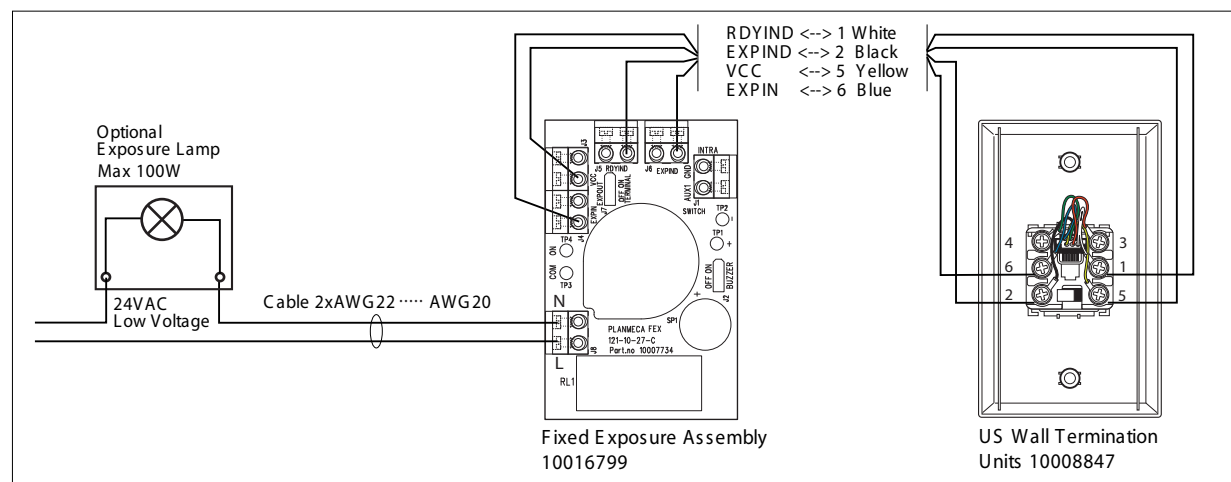
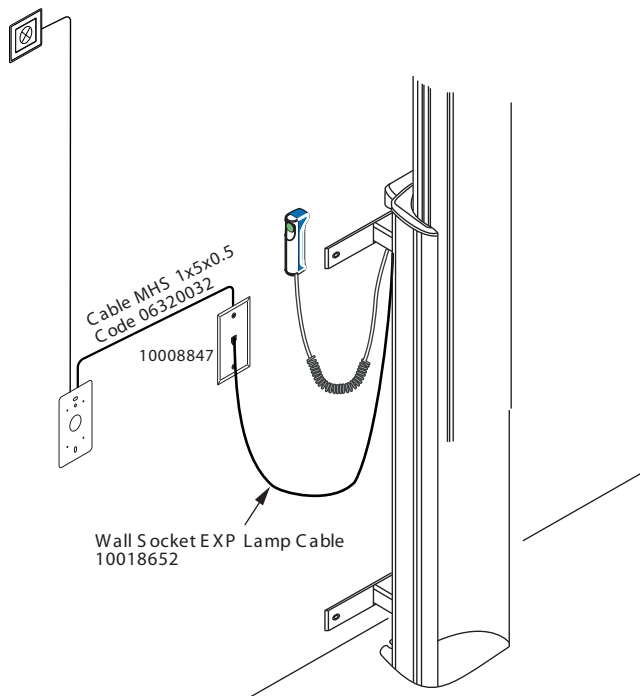


ProMax
Exposure Lamp
Remote connection EU
24.09.2009 LY



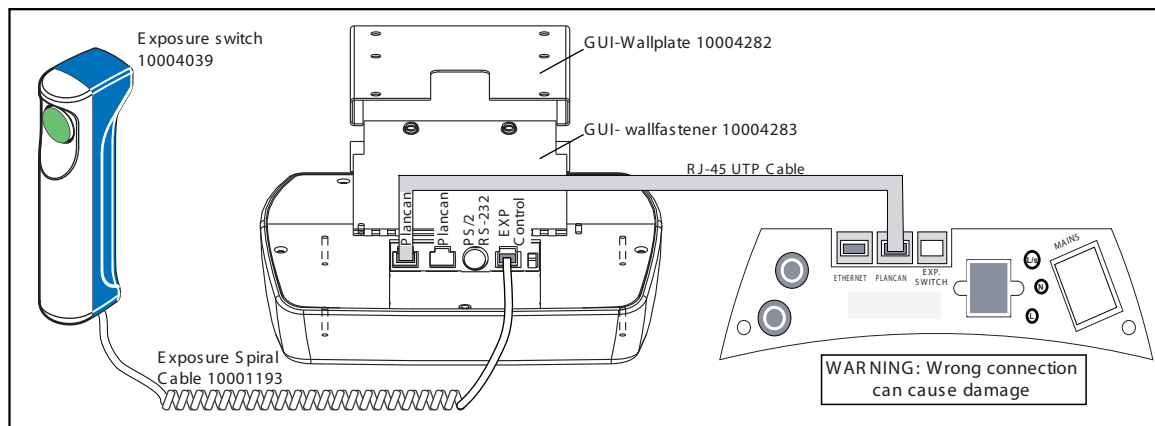
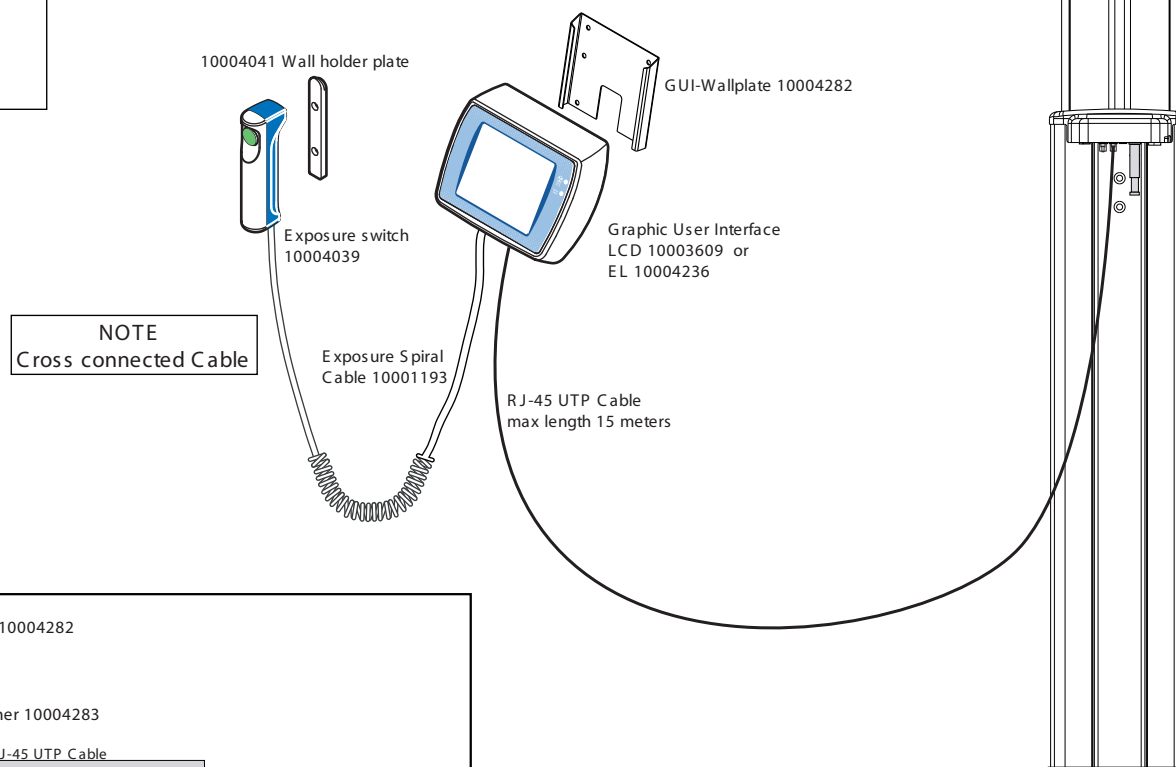
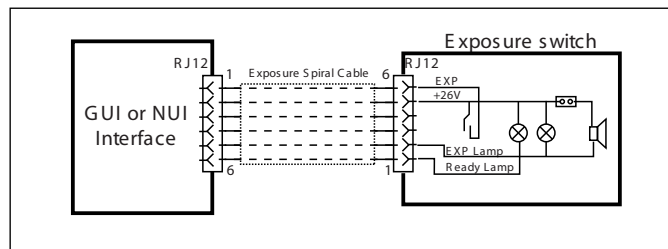
ProMax
Exposure Lamp
Remote connection US
24.09.2009 LY

Optional
Exposure
Lamp



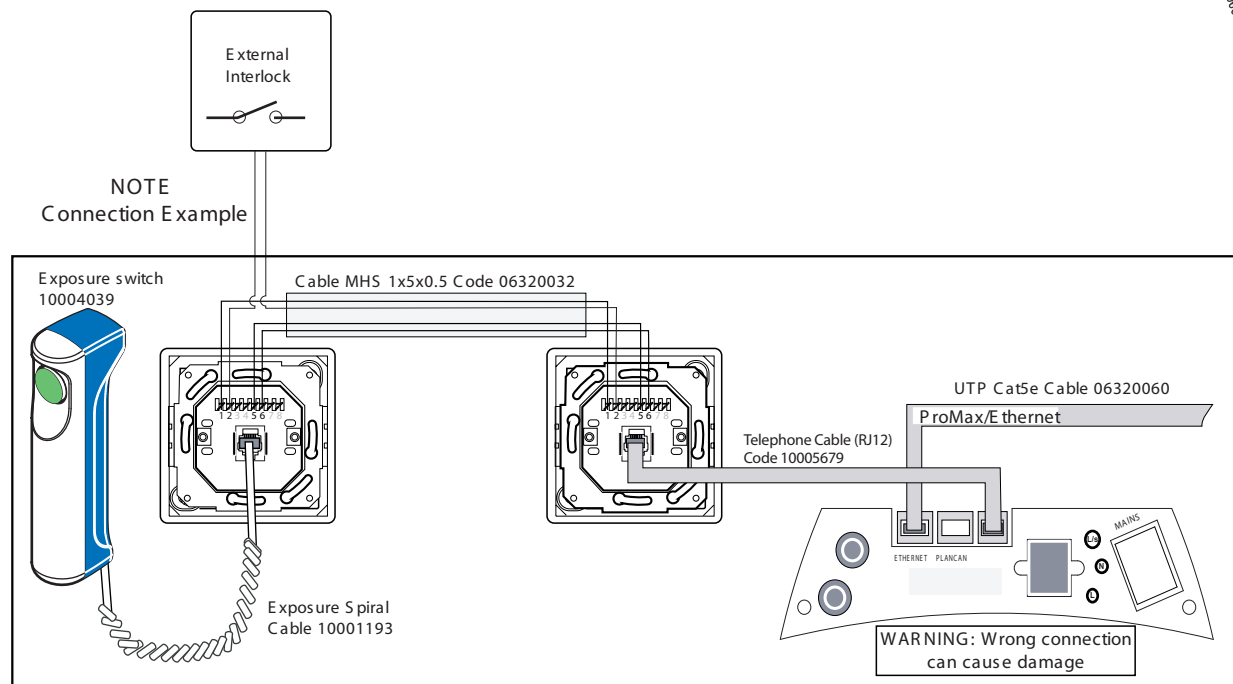
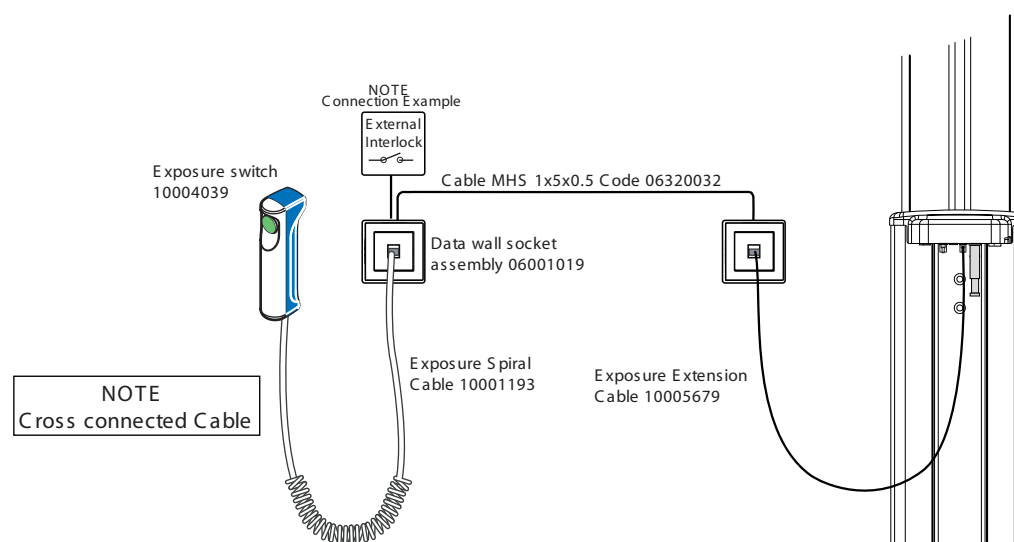
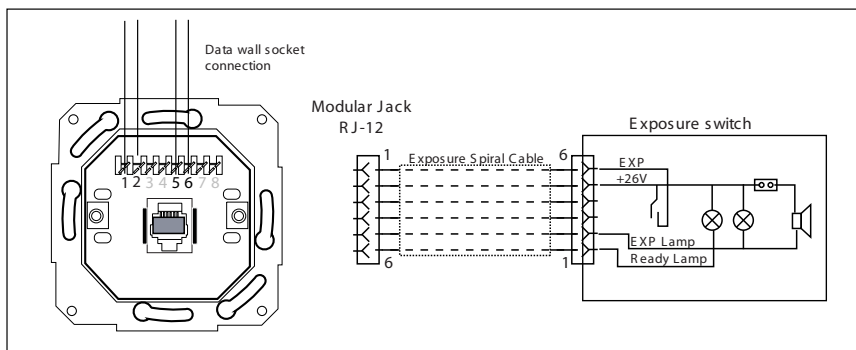
ProMax

Exposure Switch /
GUI Remote connection
24.09.2009 LY



ProMax

Exposure Switch / Remote connection
with External Interlock
24.09.2009 LY



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